

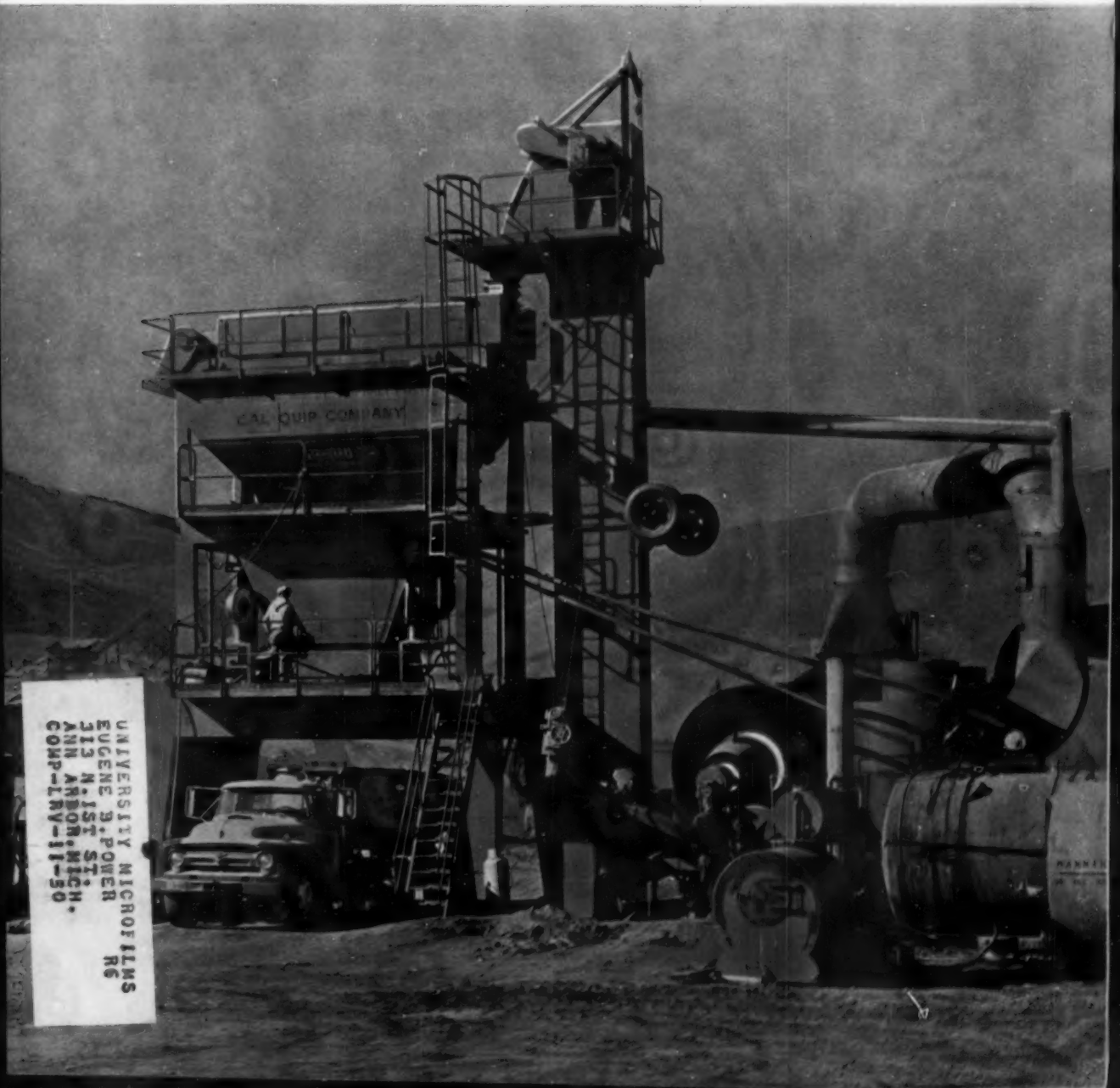
Aerial Press Tour Sells
State's "T" Program page 44

July, 1960

ROADS^{AND} STREETS

A GILLETTE PUBLICATION

Big asphalt productive capacity vs.
quick portability. See page 106.



UNIVERSITY MICROFILMS
EUGENE B. POWER
312 N. 1ST ST.
ANN ARBOR, MICH.
COMP-LN-1-1-50



**4200 3-TON VIBRATORY
BLOWS PER MINUTE AND
UNMATCHED VERSATILITY MAKE...**

JACKSON Your Best Bet for RAPID, MONEY-SAVING COMPACTION!

In laying macadam base courses of very coarse aggregate ($\frac{3}{4}$ " to $3\frac{1}{2}$ ") for instance, a single spread 12" thick usually can be perfectly compacted with just two passes of a JACKSON COMPACTOR. Time required is just about one-half that required for rolling . . . and appreciable savings are effected by single course spreading. Fines can be laid in thicker layers, with no hand brooming required, and each spread thoroughly infiltrated in a single pass.

For compacting granular soils in practically all applications, JACKSON COMPACTORS are terrific economizers of both time and money . . . the most efficient and versatile machines in the compacting category. See them at your nearby JACKSON Distributor who has them both for sale and for rent. Literature on request.

BOTH MACHINES OPERATE IN EITHER DIRECTION, NO TURNING REQUIRED

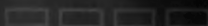
JACKSON VIBRATORS, INC.

LUDINGTON • MICHIGAN

6 UNITS ABREAST FOR MAXIMUM
COVERAGE

* 

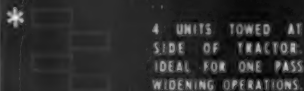
6 UNITS IN TANDEM FOR MAXIMUM ONE
PASS CONSOLIDATION

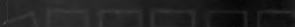


4 UNITS (or it might be 5) TO EXACTLY
FIT JOB WIDTH REQUIREMENTS

* 

5 UNITS IN TANDEM AND STAGGERED,
VARIABLE FOR A WIDE RANGE OF WIDTHS

*  4 UNITS TOWED AT
SIDE OF TRACTOR.
IDEAL FOR ONE PASS
WIDENING OPERATIONS.



SHOULDER COMPACTION IS AUTOMATIC.
End unit automatically assumes this position
— no adjustment required. Prevents raveling.

ANY ARRANGEMENT (TESTED) OF
VIBRATORY UNITS IN THE WORK-
HEAD TO FIT THE JOB MOST AD-
VANTAGEOUSLY IS QUICKLY AND
EASILY ACHIEVED.

*Attainable with optional equipment.



JACKSON TRAILER COMPACTOR may be
pushed or pulled by any prime mover
capable of working speeds as low as 50
FPM, towed to location at any road speed;
operated in either direction; controlled by
prime mover operator. Two workheads,
with as many as 4 units each may be em-
ployed, one ahead and one following
trailer. Power plant supplies both single
and 3-phase 110-115 volt, 60 cycle A.C.
and has many uses.

... for more details circle 321 on enclosed return postal card



LIMA MODEL D ROADPACKER



LIMA SUPER ROADPACKER

Two ways to lower compaction costs with fast, high-density Lima Roadpackers

- **Compact to 100% density in one pass**—often possible with Lima Roadpackers.
- **Lay fewer courses**—Roadpackers compact even 10 and 12-in layers in minimum number of passes.

High-production Roadpackers speed construction of highways, parking lots, airfields and earth-fill dams. Vibratory compaction works from bottom to top; fills voids, eliminates shoving. Roadpackers work forward or in reverse. Compact in varying widths and speeds. Travel on-the-job or over-the-road at highway speeds.

Lima Roadpackers are extremely popular with cost-conscious contractors everywhere who are interested in both high performance and low maintenance. Vibrator units are completely sealed, self-lubricated. No external moving parts; no daily maintenance required.

Two Model Roadpackers now available

MODEL D—Six hydraulically controlled vibrator shoes com-

pack up to 600 tons per hour in a 13 ft., 1 in. swath. End shoes fold up for narrow width compaction path or highway travel at speeds up to 30 mph. Compacts from 20 to 95 feet per minute using 4, 5 or 6 shoes.

SUPER—More than doubles compaction performance of any multiple-shoe vibrator machine. Designed for really big jobs. Two rows of six vibrator shoes, hydraulically controlled, compact "tough-spec" materials on production basis from 26 to 268 feet per minute in widths to 15 ft. Highway travel to 24 mph; power brakes and steering, tandem rear drive. Get compaction cost-cutting facts from your nearby Lima distributor or write to Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



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ROADS AND STREETS, July, 1960

ROADS AND STREETS

JULY, 1960

HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

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GOODYEAR

UP FOR A BIG BID?

Let Goodyear keep
your tire costs down

FINDING THE WORK FACTORS—Goodyear Big-Tire Specialists are prepared to analyze your tire needs with an eye to keeping costs under control. These specialists will check the terrain, loads, climate, roads, schedules and speed problems that confront you, and can select the right Goodyear tires to help you solve them.

PUTTING BIG-TIRE KNOW-HOW TO WORK—From the world's greatest wealth of experience, Goodyear Big-Tire Specialists are uniquely qualified to help you. And they'll provide the best in tread and body designs to help safeguard your contract and your profits.

SETTING UP BIG-TIRE SERVICE—You say the word, and Goodyear Big-Tire Specialists will set up a tire-maintenance program at the job-site to help save you man-hours, machine-hours and useful tire life. In addition, Goodyear Contractor Service *will travel* with your job—handle all your tire maintenance and repair needs.

With BIG-TIRE PERFORMANCE

Example: SUPER HARD ROCK LUG

Here's one of Goodyear's Big Tires for the Big Bid you have coming up. It's the SUPER HARD ROCK LUG, built for heavy loads and no roads to make the going easy. Triple-tough 3-T Nylon Cord for the greatest tire stamina, plus new, special cut-shrugging rubber compounds, make this tire a real cost-saver in the roughest off-highway service.

For details on this and other Goodyear special-duty tires, and the Goodyear Contractor Service, see your Goodyear dealer. Or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

Lots of good things come from

GOOD YEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

ROADS AND STREETS, July, 1960

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INSTANT LATERAL DIGGING WHEEL SHIFT LICKS TIGHT-QUARTERS TRENCHING JOB

THE CLEVELAND JS-30 TRENCHER, with instant lateral shifting and power tilting of its digging wheel, got high daily trench production for McShane Contracting Co. of Pittsburgh on a water line job that would have slowed an ordinary trencher to a snail's pace. The trench had to be dug in an extremely narrow road shoulder hemmed in by poles, trees and heavy growth on side slopes rising sharply within less than six feet of the pavement's edge.

Able to dig behind either crawler or anywhere within its 6-foot width, the JS-30 easily dug past the obstructions in the narrow shoulder. Lateral position of the crawlers was changed as necessary to get by obstructions, while the JS-30's digging wheel was power-shifted laterally, keeping trench digging right on line. Power-tilting of its digging wheel allowed the JS-30 to dig straight vertical trench with one track higher than the other on the side slopes, without blocking or cribbing.

THE JS-30 — A TRENCHER OF AMAZING UTILITY

- Digging wheel power-shifts 5' from side to side
- Digs trench flush with parallel pavement, curbs, etc.
- Digs trench virtually flush with trees, poles, fences, etc.
- Digs vertical trench on side slopes, cuts blocking, cribbing
- Excavates bell holes, saves on trench width
- Digs 11"-24" wide, to 5½' deep; digs to 6' wide with power-shifting of wheel
- 100% control of all operations at operator seat.

Get the complete story on the JS-30 from your distributor

The CLEVELAND TRENCHER Co.

20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO



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ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 68 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

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GILLETTE PUBLISHING COMPANY

Publication and Editorial Offices:
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SPECIAL REPORT TO CATERPILLAR OWNERS:



Parts you can trust
...cost less per hour

Converting to Lifetime Lubricated Track Rollers costs less than you think

Lifetime Lubricated Roller Groups, including seals, shafts and end collars, *cost only a little more* than ordinary Bellows Seal Rollers without end collars. But this small expense of *initial* installation rapidly disappears through noticeably lower owning and operating costs.

Based on savings from seal replacement alone, Lifetime Lubricated Rollers soon make up the difference. The metal rings of the Floating Ring Seal can be used over and over again. Take a 14-roller D8. At every roller rebuild, you probably have to buy 28 bellows seals @ \$3.97* each or a total of \$111.16. Compare this with the rubber "O" rings costing a total of only \$45.08*. You save \$66.08 in seal replacement costs every time you rebuild or replace. Similar savings are available on all models. And, replacement Lifetime Lubricated Roller and shaft assemblies without end collars are priced below those of Cat Bellows Seal Rollers.

But your savings don't end here! Here are other benefits you get from Lifetime Lubricated Track Rollers:

- 1. Longer Lived Roller Shells and Component Parts.** The Lifetime Lubricated Roller is much stronger and has more metal in the wear zones, specially hardened for extra resistance to wear. And bushings, bearings and shafts are larger and stronger and will last longer. These components are *always* bathed in *clean*, heat-dissipating oil (not grease). Dirt just can't get in to accelerate wear—oil can't get out, thanks to the patented Floating Ring Seal. This means you won't be buying as many replacement bushings and shafts at rebuild or roller replacement time.
- 2. Maintenance Is Eliminated.** Lifetime Lubricated Rollers need no servicing until they're finally rebuilt. You don't have to spend any time nor money for lubrication during the rollers' lives.
- 3. Easier Installation.** Snap-on rings hold seals and end collars in place *before* mounting. End collar bolt holes line up easily with track roller frame holes at installation. Your tractors will be on the go much sooner.

See your Caterpillar Dealer. He'll give you the complete facts on the economy of investing in Lifetime Lubricated Rollers... for *all* Caterpillar track-type equipment.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

*Suggested consumer prices for these Caterpillar parts

SERVICE TIP:

Lifetime Lubricated Rollers need no servicing. But when rebuild time finally comes, keep metal rings matched in original pairs.

CATERPILLAR

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Where heavyweights move job records prove... **FIRESTONE TOUGHNESS PAYS OFF BIG!**

Extra toughness: you get it in the cord, in the rubber . . . in every inch of Firestone off-the-highway tires. And it pays off big! Helps keep equipment on the job; helps keep jobs on schedule. Behind Firestone toughness are such exclusives as (1) Firestone Rubber-X, longest-wearing rubber ever used in Firestone tires and (2) Firestone Shock-Fortified nylon cord for top protection against impact damage. Through Firestone's Giant Tire Service, an expert will match tires to your job, and handle all tire maintenance. Just contact your Firestone Dealer or Store. Or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Co., Akron, Ohio.

ALWAYS SPECIFY FIRESTONE TIRES WHEN ORDERING NEW EQUIPMENT

Firestone

BETTER RUBBER FROM START TO FINISH

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Super Rock Grip
Wide Base*

Super Rock Grip
Deep Tread*

TUBELESS OR TUBED

Copyright 1960, The Firestone Tire & Rubber Co.

*Firestone T.M.

ROADS AND STREETS, July, 1960



NEW heavy-duty crawler drill

MOST RUGGED—tons of sound design

MOST POWERFUL—outperforms 5½" drills

MOST VERSATILE—4" to 6½" holes, vertical to horizontal

The new Ingersoll-Rand Crawlmaster is a *multi-purpose machine* that meets every requirement for percussion, rotary or Downhole drilling of 4" to 6½" blast holes in any type of ground. Here are just a few of its outstanding features:

Constant-Pressure, Double-Acting Hydraulic Feed—smooth, infinitely-variable power for drilling pressure or pulling stuck steels. Drill won't jump ahead in pockets or fissures.

Simple Hydraulic Control Of All Tower Positions. Tilting of tower on yoke and raising or lowering of yoke hydraulically powered by separate cylinders. All throttles out-front for easy operation.

Throttle-Controlled Reverse Rotation permits fast uncoupling of steels without having to climb tower to reverse drill.

Ejector-Type Dust Collector has no moving parts to wear out or maintain. A simple air-jet does all the work.

Heavier—Extra weight is reflected in sound design as-

sur-ing extra stamina for the toughest drilling jobs. Has rugged, tractor-type crawlers with enclosed gear drive.

Four 30" Stroke Hydraulic Leveling Jacks permit accurate tower positioning with maximum stability on rough terrain.

Hoist, Rod-Changer And Hydraulic Wrench greatly simplify addition or removal of steel sections.

Interchangeable drills and rotation units permit one machine to be used for percussion, rotary or Downhole drilling of 4" to 6½" holes, taking power from a 600 or 900 cfm portable compressor. For a new high in drilling speed and economy, ask your I-R engineer for the Drillmaster story. Or send for Bulletin 4211.

Ingersoll-Rand
33A5 11 Broadway, New York 4, N.Y.



A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

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BUFFALO-SPRINGFIELD KOMPACTOR COMPACTS MORE THAN 1200 YDS. PER HR. COSTS ONLY 2¢ A YARD TO RUN

It's been doing it and proving it for years — for contractors all around the country.

Self-propelled, field-proved Kompactor meets job density specs with fewer passes — costs less to run. It operates on an interrupted pressure principle, staggered rows of heavy steel pads direct all compaction effort downward. Result: more uniform density of materials, no displacement of materials due to "bull-

dozing" ahead of the wheels, less time and effort required to meet compaction specifications.

Another reason for Kompactor's widespread popularity is its ability to wheel close to culverts, walls, and abutments eliminating costly and time-consuming hand tamping. And since the Kompactor is self-propelled, doesn't tie-up expensive equipment in compacting work. Ask your Buffalo-Springfield distributor for details, or write for booklet.

BUFFALO-SPRINGFIELD CO.
Springfield, Ohio



K A Division of
KOEHRING
Company



B9

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Koehring 445 walks precast bridge member into place on Colorado highway job.



Koehring 555 on Long Island expressway contract sets heavy concrete manhole.

UNDER LOAD OR ON THE ROAD NOTHING HANDLES LIKE A KOEHRING

Koehring heavy-duty truck cranes give you the mobility and stability to get toughest lifting assignments finished quickly. Mounted on rugged 4-axle truck, they convert quickly from fully equipped crane to roadable machine for traveling. Counter-weight, boom, and outriggers can be easily removed to reduce machine weight to meet road limits.

You get extra work capacity for safe, sure lifting and spotting. Booms have combination pin-pad connections . . . combine safety of bolted connections with quick-change advantages of pin connections.

For complete information, get in touch with your local Koehring distributor or write to us for catalogs . . . do it soon.

K34

**MORE WORK CAPACITY...
MORE PROFIT PER DOLLAR INVESTED**

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

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ROADS AND STREETS, July, 1960

How to return stored engines to service

In a previous issue of Lube Logic we gave you an 11-point program designed to protect gasoline and diesel engines during long idle periods. Now we'd like to finish what we started by describing the routine for taking engines *out* of storage and putting them back into action.

1 Where Texaco Rustproof Compound L has been applied to exterior of engine, remove with kerosene.

2 Remove waterproof paper and tape from all openings.

3 Remove spark plugs. Clean them and check the gap settings before replacing.

4 Remove distributor cap and clean Texaco Rustproof Compound L thoroughly from lobe of breaker cams. Replace cap.

5 Check the level of the crankcase oil. If it's at the full mark, there's no need to drain the oil before operating the engine unless it requires a different grade. If the oil has fallen below the full mark during storage, drain the engine and locate the oil leak, and repair it, then refill with the proper grade of oil, before operating the engine. The first oil change after the engine is back in service should be made in half the usual period.

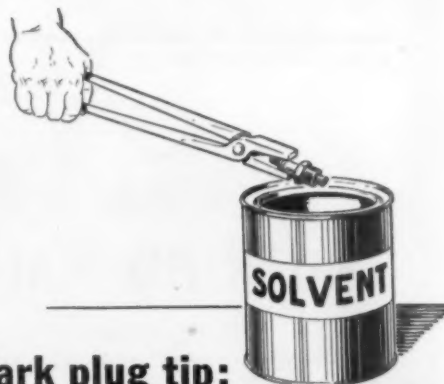
6 Check the cooling system for leaks, and add water or Texaco PT Anti-Freeze if necessary. It's not necessary to drain and flush if the cooling system was filled with a rust-inhibited anti-freeze before storage.

7 Fill the fuel system, start the engine, and let it run for a while. Check the oil pressure, and check for overheating and oil and fuel leaks.



End-of-shift is the best fueling time

They say there's a time and a place for everything, and for refueling equipment the best time is at the end of each day's work. And here are two reasons why. End-of-shift minimizes the possibility of fuel-tank rusting, because there's no room for condensate to form in a tank that's full of gasoline or diesel fuel. And tank-bottom sediment, stirred up by pumping in fuel, has a chance to settle down overnight, so it won't be drawn into the fuel line.

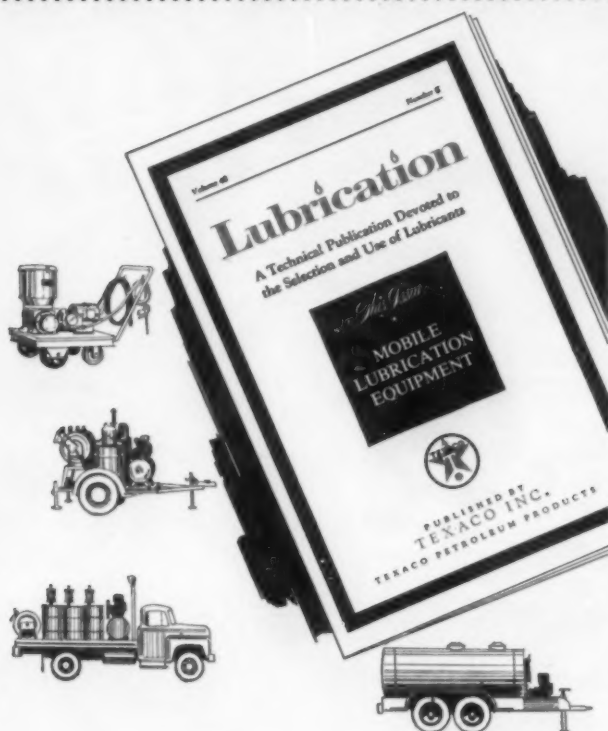


Spark plug tip: Degrease before you blast

Don't depend on your spark plug cleaner to do everything. As a matter of fact, you can actually make things worse by blasting an oil-fouled plug. Heavy oil deposits on the plug will pick up the abrasive and hold it in the recesses between the shell and the insulator. Result: burning and ultimate failure because these deposits can seriously affect the spark plug's ability to dissipate heat at high engine speeds.

Moral: degrease oil plugs in a suitable solvent and dry them *before* you blast.

prolong equipment service life

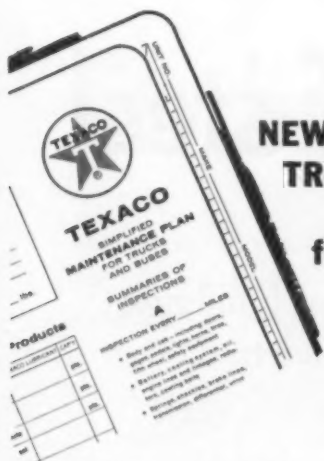


The whole truth about mobile LUBE RIGS

- What good lube rigs are made of—the products and the dispensing equipment.
- How to use lube records to make your rig more valuable.
- Special purpose lube rigs.
- Pros and cons of mobile and centralized lubrication.

What does it take to make a mobile lube rig? What do you put on it? How do you use it? The questions have been coming in so fast lately that Texaco has devoted a whole issue of its magazine, *Lubrication*, to answering them: the March 1960 issue, titled "Mobile Lubrication Equipment."

Lubrication is a major factor in cost control, and lube rigs can be a major factor in thorough maintenance, so send for your free copy of the March *Lubrication*. Supply of these valuable booklets is limited, so if you want one, send in your request now to Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept.



NEW TRUCK RECORD FOLDER fits itself into your schedule

Texaco's flexible new truck record folder lets you stick to the lube schedule that works best for you without running into bookkeeping problems. Lubrication and oil schedules are completely separate from mechanical maintenance and replacement parts schedule—you don't have to follow any pre-established routine to use the folder profitably. And this new folder accounts for every single dollar you spend on truck maintenance for a whole year. Get yours now.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

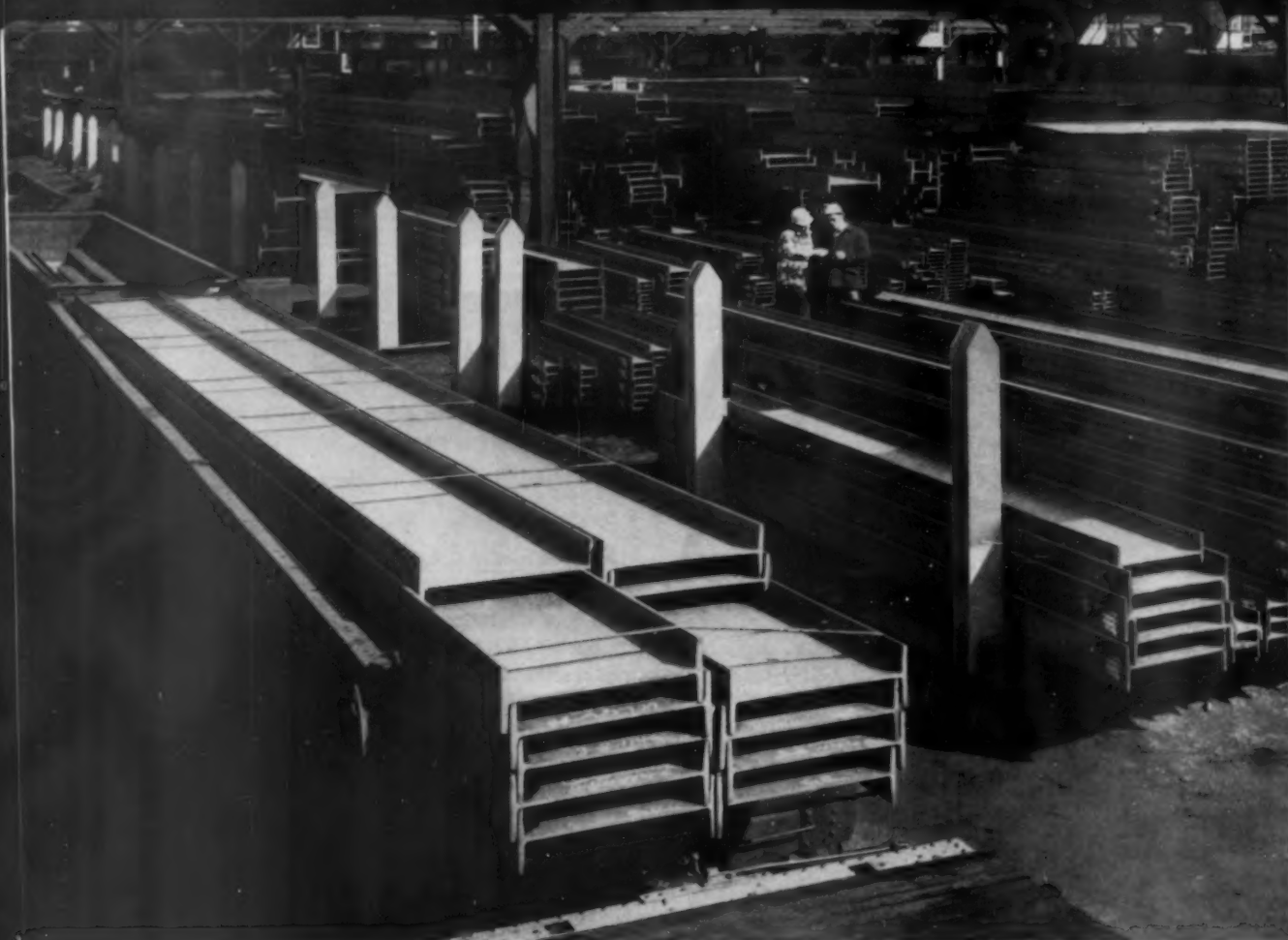


TEXACO LUBRICATION ENGINEERS

Every now and then we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in money and time can be made. If Lube Logic doesn't solve your problems, call your local Texaco man. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

TEXACO 
Throughout the United States
Canada • Latin America • West Africa

R-11



No matter what you bear . . .

There's plenty of steel

There's plenty of structural steel to go around—
for highway bridges, industrial and commercial buildings,
schools, you name it. You can design in steel with
complete confidence that the structural shapes you need
will arrive at the site on time,
fabricated exactly the way you want them.



*for Strength
... Economy
... Versatility*

BETHLEHEM STEEL



for bridges

BOTH STEEL PRODUCERS and steel fabricators have expanded facilities. That means you can get all the fabricated shapes and plates you need for highway bridges—when you need them.

Structural steel is still the most versatile construction material around. It can be punched, welded, flame-cut, sheared, sawed, bolted, riveted—"tailored" to any shape or form to meet structural and aesthetic requirements. Fabricated in the shop, it arrives at the bridge site ready to go into place. It is available in a wide range of sizes, shapes, and strengths. And it's mighty easy on the budget. For highway bridges, as for all types of structures, structural steel makes a lot of sense.



BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

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Four Fuller-equipped scrapers lead the way for Hubbard Construction Company on roadbuilding, development and utility installation projects. Equipment includes one Euclid TS-24, a TS-14 and two S-12 Scrapers featuring Fuller S-G-1220 Transmissions, and two LeTourneau-Westinghouse Tournapulls with Fuller L-1220s.



Geared by FULLER . . .

"We get faster work cycles and longer life with countershaft brake and pressure lubrication systems."

"Reliability, economy and serviceability are exceptionally important in purchasing new construction equipment," says J. C. Reddick, Vice President, Hubbard Construction Company, Orlando, Florida. "Fuller Transmissions meet the requirements for long life and fast work cycles that we must

have in our scraper operations."

Fuller's countershaft brake gives quick, easy upshifts without double clutching, keeps speeds up and cuts cycle time. The pressure lubrication and filtration system prolongs gear and bearing life.

For long life, easy shifting and pos-

itive lubrication in your scraper operations, specify Fuller Transmissions which include the countershaft inertia brake and pressure lubrication and filtration systems.

Ask your dealer about these features designed to put more profit in your operation.

FULLER — TRANSMISSION DIVISION —
MANUFACTURING COMPANY
 KALAMAZOO, MICHIGAN



Subsidiary EATON Manufacturing Company

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 Automotive Products Company, Ltd., Automotive House, Great Portland Street, London W.1, England, European Representative

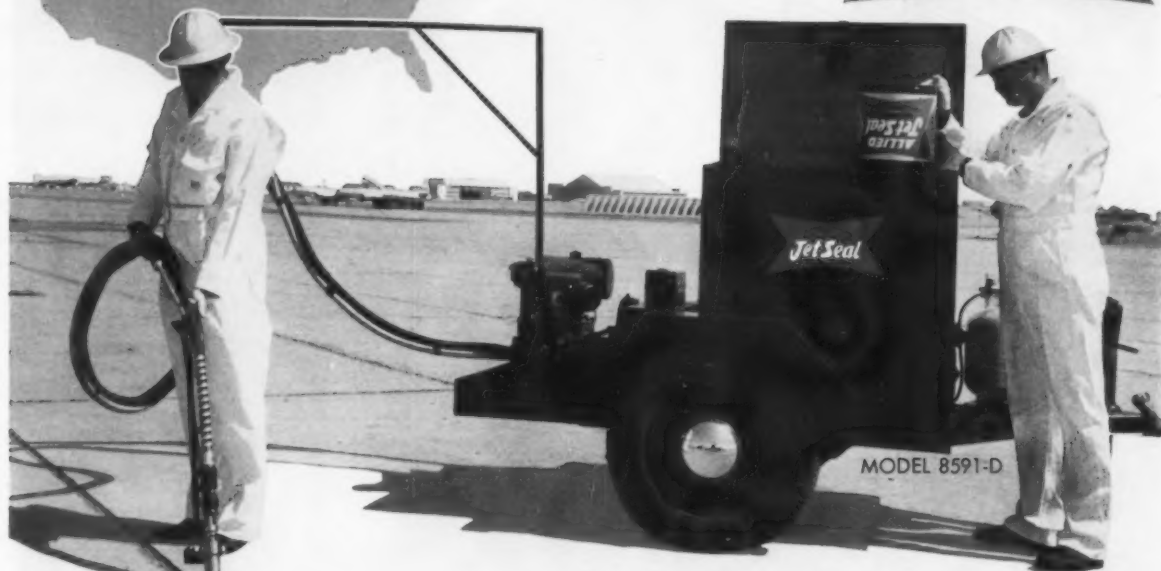
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***PROVED!**

ACROSS THE NATION...

ALLIED

Jet Seal®



THE SUPERIOR JOINT SEALANT

JET SEAL APPLICATORS OFFER FAST, EFFICIENT OPERATION

The Allied-Stroud Applicators, Model 8591-D (shown above) and the NEW COMPACT Applicator (Model X691-E) offer the most efficient and complete method of joint sealant application for any sealing job.

Manufactured by Allied-Stroud Corp., a division of Allied Materials Corp., the Allied-Stroud Applicators are the ONLY sealant application equipment authorized for the application of Allied JET SEAL (Products 9015H Highway, 9015M Military, 9015T Hydraulic).

For complete detailed information about the Allied-Stroud Applicators and Allied JET SEAL, the Original two-component, polysulfide, polymer, elastomeric joint sealing compound, write to:

USED IN MAJOR PROJECTS EVERYWHERE (Partial List)

- Los Angeles Internat'l Airport
- Yuma Naval Air Station, Arizona
- O'Hare Internat'l Field, Chicago
- New York Internat'l—Idlewild
- Miami Internat'l Airport
- Niagara Power Project
- New York State Thruway
- Tennessee Highway Dept.
- California Highway Dept.
- Connecticut Hwy. Dept.

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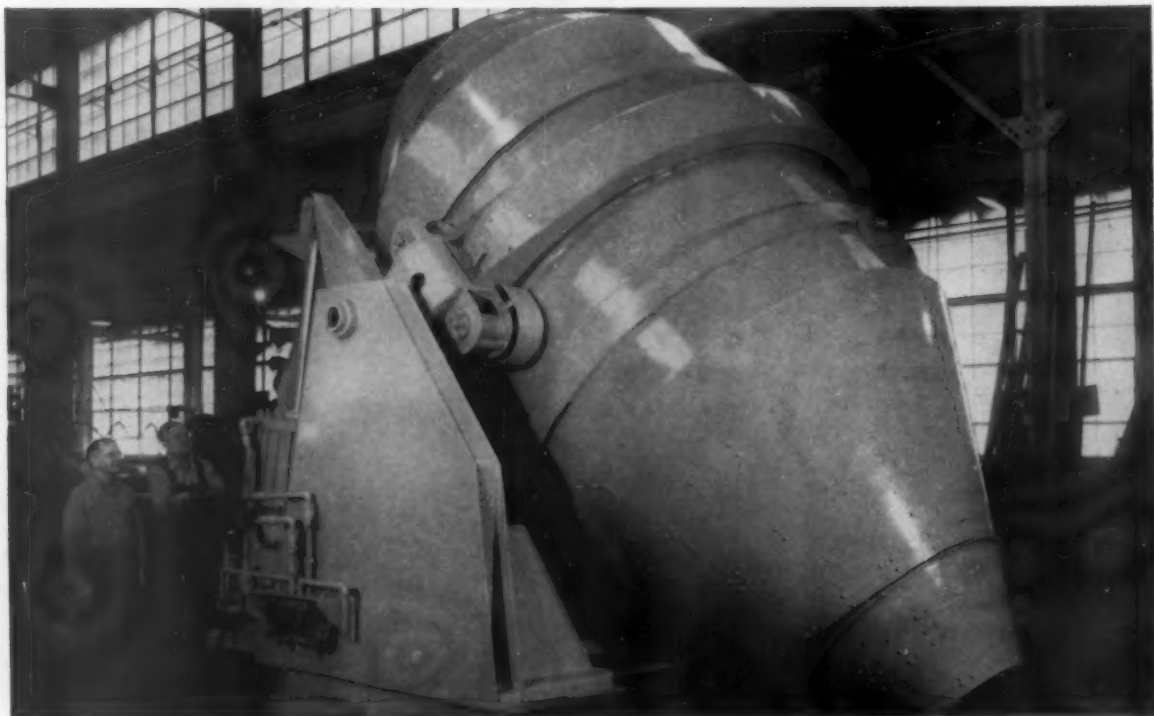
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ROADS AND STREETS

Sixty-Eight years of Editorial Leadership

Washington News Letter

By Duane L. Cronk, Director, Highway Information Services, Inc.

July 10, 1960

Highway engineers at the Western Association of State Highway Officials meeting in Portland, Oregon, last month received some sympathetic but blunt advice from their Washington representative, Alfred Johnson. As the comments of one who is a discerning observer of national developments, Mr. Johnson's remarks are as pertinent to highway men in Maine and Florida as in Oregon. He made several points worth special attention, including these:

That the most exposed individuals in the current Congressional investigation are the nation's 50 top highway department chiefs, and that they had better stay on top of their jobs without relaxing their responsibilities "even for a short while."

That the Bureau of Public Roads must not tie up state roadbuilding procedures with red tape in a panic to keep its own skirts clean during this period of Congressional scrutiny.

That the states must determine their true engineering costs if they are to meet the criticism that consulting engineers can do the job more economically.

* * *

Mr. Johnson reminded the assembled Western officials frankly that there is "only one" reservoir of skilled highway engineers and technicians available in this country. These men will design and build the roads come what may, but administrators are expendable.

"When a corporation starts going in the red, that corporation gets a new president, or when a ball club starts to drop in its standing the fans clamor for, and get, a new manager."

"Do not take these admonitions lightly," Mr. Johnson warned the top administrators.

* * *

The next few months will see a demand build up for "drastic" changes in the traditional relationship between the states and the federal government in highway system management, Mr. Johnson predicted, and those changes can go in only one direction - "that is for more federal control." Already, he pointed out, the BPR has started to wrap up the states in more and more administrative safeguards to prevent future irregularities:

"There seems to be indications of unconsciously forgetting the partnership relationship, and of the Bureau becoming the Great White Father protecting the states from their own potential transgressions - which takes on more of the master-servant relationship instead of the partnership.

(continued on next page)

"If each and every future investigation results in more tightening up on the part of the Bureau, the result will be a crippling paralysis that will finally immobilize the States as far as any highway prerogatives may be concerned, and the States will finally end up in the menial role of 'hired help,' and state highway administration may decline to a foreman's role."

Take action against the individual wrong-doers when you have to, Mr. Johnson urged the Bureau, but don't stifle everyone with blanket restrictions.

The states are going to be on the defensive, also, in the matter of highway engineering costs, Mr. Johnson said. He advised the officials they had better find out just how much their design work is actually costing the taxpayer on the "do-it-yourself" basis.

"Do not underestimate the aggressive and determined attack on the state highway departments by some of the consulting engineering interests, who charge that they can actually do the highway program engineering and construction supervision job cheaper than the States, but that the States have such confused accounting system that the true State costs are obscured and cannot be accurately compared.

"I suggest you assemble some cost data if you do not have it readily available, for you undoubtedly will be required to have it before very long."

He expressed his own personal philosophy, "I am unable to understand how the consultant can perform the services cheaper than the state if he furnishes the same level of service, since he must add promotion and profit items in his costs," but added, "I hope such a contest does not hurt the reputable highly experienced consultant who is needed and has a place in the program."

"Fight back, let everyone know what a fine job you are doing, and stay on the aggressive," Mr. Johnson told the highway chiefs, "and in the long run you will be vindicated. I have stated repeatedly," he declared, "that the conduct of the highway program is the cleanest that Congress will ever investigate and the vast majority of the highway people in the country . . . have plenty of accomplishments in which they can justifiably take pride."

* * *

Congress is expected to pass the \$925 million ABC bill in much the same language as it was introduced. The only argument in the House was between the highway fraternity which wanted \$950 million (the original intent of Congress expressed several years ago was that funds for the regular federal-aid systems should be boosted about \$25 million a year) and the Administration which wanted the sum dropped to \$900 million in the interests of economy.

(As this is written, the word from the Senate is that a floor fight will be staged for 300 miles of new Interstate mileage for Hawaii and Alaska. Also, a few senators from "distressed" areas want another "emergency" road fund to prime the pump. They are asking \$100 million.)

An interesting sidelight: Maryland and Delaware were given permission to waive federal aid scheduled for a new 40-mile road, which they now plan to build as a toll road. Under the present Interstate project schedule, they could not start the facility for another 8 or 10 years. Studies show that, as a toll facility, the highway will make a lot of money in that time. So the two states are giving up the "sometime" 90% federal aid to go it alone. It's bound to start Congress thinking.

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feature. It is a rugged, heavy duty machine with electrically driven elevator and hydraulic controls. Production models in the field are setting new records for moving dirt, and operators report extremely good balance which results in easy handling. Place your order now.



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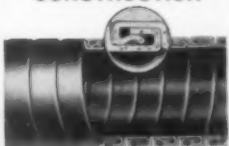
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People

New District Engineers in New York

Three new assistant district engineers have been appointed by the New York State Department of Public Works.

Franklin L. Moon, at Utica; Charles H. Hoenstein at Albany; and Lewis W. Hallenbeck at Hornell.

All three are careermen in the department.

E. L. ROETTINGER, Wisconsin's veteran state highway engineer, 60, observed his 25th anniversary in that capacity recently in Madison. He holds the distinction of being "longest in service" of any of the present state highway engineers in the nation.



E. L. Roettiger

MYLES C. MCGOUGH has been elected executive-vice president of Merritt-Chapman & Scott Corporation, in charge of the company's construction department. Naming of Sherman H. Serre as senior vice-president and Frank R. Creedon as a vice-president of this department also is announced.

Mr. McGough, who first joined Meritt in 1936 as a project engineer, succeeds William Denny who is retiring from active service with M-C&S after 32 years with the company.

WILLIAM F. CALLAHAN has been reappointed to an eight-year term

Correction

The notice regarding John C. Black's retirement from Gillette Publishing Co., as printed in our May issue, contained a typographical error which will be confusing to people familiar with the development of road-building equipment and misleading to those looking for construction history. The work mentioned as done without powered machinery was in the year 1901, not 1910, as stated. The nine years interval brought power into all major construction jobs.

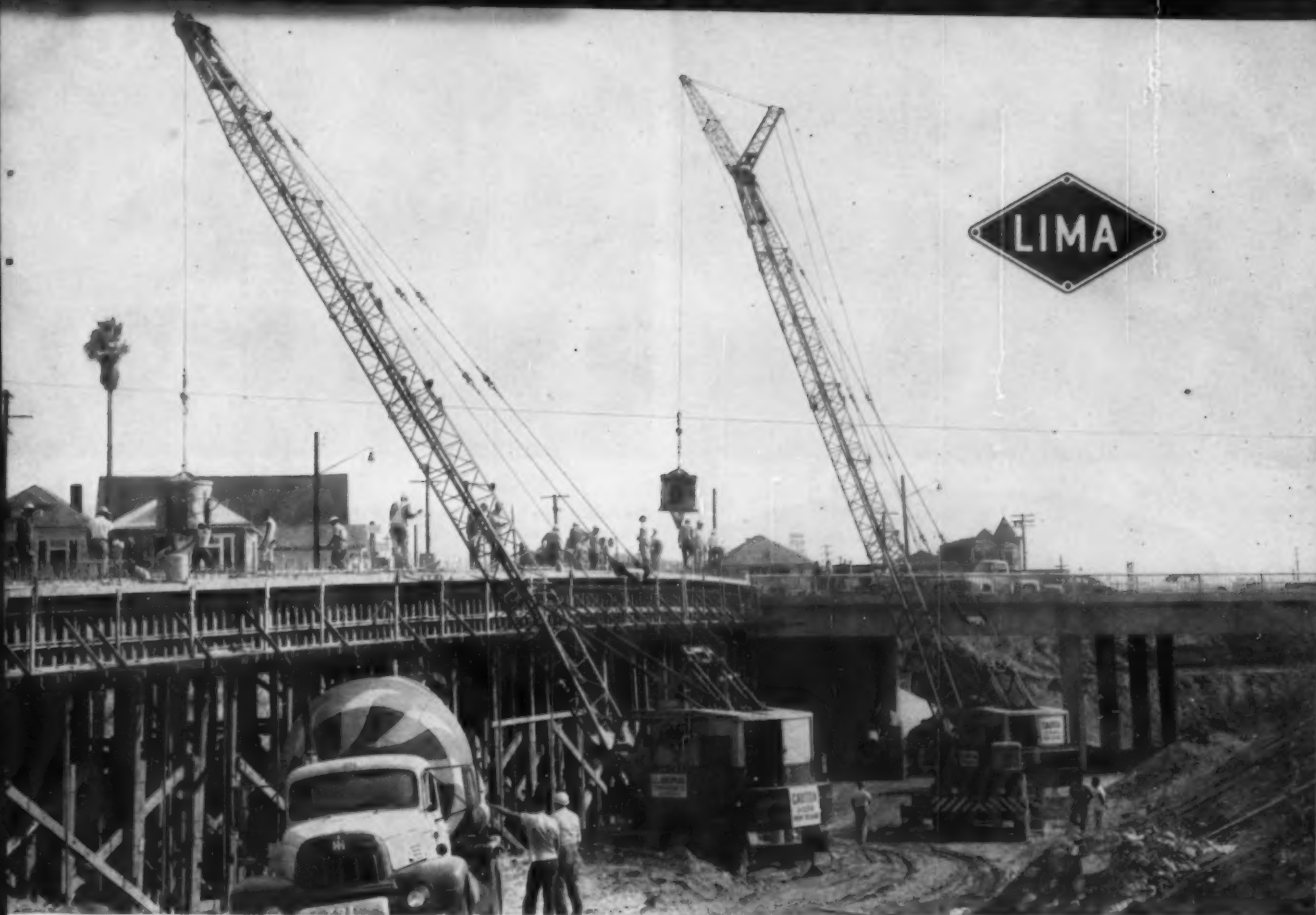
as member of the Massachusetts Turnpike Authority and again designated as chairman.

ENOCH R. NEEDLES, a partner in the New York and Kansas City engineering firm of Howard, Needles, Tammen & Bergendoff, and a chief participant in the design and construction of the Pulaski Skyway, N. J. Turnpike, and other highways and bridges has received the Allan R. Cullimore Award for Distinguished Service from Newark College of Engineering.

S. O. LINZELL, former director and deputy director of the Ohio Department of Highways, has joined Michael Baker, Jr., Inc., consulting engineers. He will serve this Rochester, Pa., based company as a mid-west engineering representative with headquarters at Columbus, Ohio.

JAMES C. HARDING, commissioner of Westchester County, New York, has been appointed the official representative of the American Society of Civil Engineers on President Eisenhower's Committee for Traffic Safety.

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California's Golden State Freeway construction is speeded as two Lima truck cranes pour concrete on 1¼-mi. section near Los Angeles.

Strong-boom Limas dig, hoist, pour for California contractor

"In our book, Limas are fast, hard-working, well-built machines. We use them for everything—excavating, concrete pouring, and hoisting. We particularly like the strength of the boom. It seems the boom sections are heavier and better constructed than on other make cranes.

"We also feel that Limas are high-production machines—we have tested their performance against a competitive machine and it couldn't begin to measure up to the Lima's output. Because Limas are built better, they stand up longer and are easy to maintain."—*F. A. Seymour, project supt., J. C. Boespflug Construction Co., Los Angeles.*

Lima stands 100% back of both crane and carrier—

no division of responsibility between manufacturers. You can be sure that Lima truck cranes are designed and built, from ground up, for power, mobility and easy travel at highway speeds, yet with strength for heavy lifting jobs under the most difficult operating conditions.

There's a Lima type and size for every job requirement—crawler cranes to 140 tons, 80 tons on rubber; shovels to 8 yd.; draglines variable. Choice of power. Prove to yourself just how good Limas are. See them at work. Talk to their owners. For facts and figures, contact your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, O.

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GRADE Use "carry-type scraper" action to grade with inch-close, labor-saving accuracy. Watch the earth boil into this 1½-cu. yd. Four-in-One as the operator does precise finish-grading.

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exclusive shock-swallowing Hydro-Spring performance protection. See what it means to upgrade your income with a 4-in-1, far above what an old-style single-action loader, or any other limited-duty rig can earn you. Let your International Drott Distributor demonstrate!



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BACK-DRAG Pull down materials wholesale (and safely) from the sand or gravel bank. And grade hard-to-get-at slopes with easily-controlled 4-in-1 back-drag action—which you get by simply moving a lever!

SCARIFY Use the scarifier attachment to loosen stony or compacted soils for easy loading or blading. The third valve of the standard International Drott hydraulic system provides the control power for the scarifier.





STRIP Set the 4-in-1's clam in "carry-type scraper" position—strip sod or topsoil with efficiency to match specialized, single-purpose stripping equipment. And get jobs other rigs can't do.



SPREAD On-the-go, put down a layer of topsoil, fill dirt, or "cover" with exclusive 4-in-1 "carry-type scraper" accuracy. Regulate thickness of layer you spread, with fingertip ease!

utility!

BOTTOM-DUMP End the sticky materials problems, for good! Opening the clam of this 2¼-cu. yd. TD-15 Four-in-One pulls material from bucket surfaces—gravity down-pull does the rest—to assure positive, self-cleanout bottom-dumping.



PICK-UP Employ easily-controlled clam action to fill the 4-in-1 with elusive loose materials, in one fast gulp—and without "chasing" them. Watch this 1½ cu. yd. TD-6 Four-in-One! You eliminate need for hand-shovel clean-up labor!



DO SHOVEL WORK Apply famous 4-in-1 pry-over-shoe break-out power and get power-shovel-like excavating force. This 3-cu. yd. TD-20 digs up concrete slab, tons at a time with up to 43,150 lbs. of break-out force—replaces a boom-type rig here!

BULLDOZE Open the 4-in-1's clam and you've got a full-capacity, earth-rolling dozer—depth-regulated by positive radius control. This action can "double" for a specialized dozer 'most anywhere! And it's instantly available at a touch of the "job-selector" lever!





Austin-Western Roller-Compactor

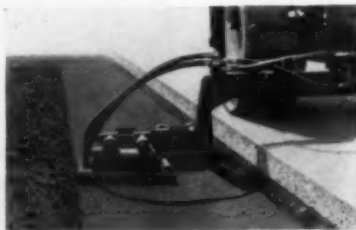
Saves cost of second machine!

"Our A-W Roller Compactor does the work of two pieces of compaction equipment, saving the cost of an additional machine. It makes possible the placement of a 10-in. stone base in a single course.

"On one hilly highway job we encountered an unusually slippery limestone aggregate. The A-W Roller-Compactor was the *only* equipment we had which could compact loose material on grades of 1% or more under its own power. Without it, we would have had to tow rollers up hill to get the job done."
—W. O. Faylor, Middlecreek Construction Co., Winfield, Pa.

Three-shoe vibratory unit attaches to Austin-Western and most other makes of 3-wheel rollers. Vibration penetrates to bottom of lift, reacts upward and effectively keys low-level material for maximum consolidation in fewest passes. Compactor attachment combines with 3-wheel roller to deliver both surface-

sealing static pressure and deep-reaching vibratory action in one pass. Dependable under severest operating conditions; easy to maintain. Learn how you can reduce compaction costs. See your nearby Austin-Western distributor today or write us for facts and figures.



Vibratory widener attachment — for use with Roller-Compactor unit on most makes of 3-wheel rollers. Mounts right or left; ends need for trench roller.

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Publications

Welding Society's Supplement Available

The American Welding Society announces the 1959 Supplement to the AWS Bibliographies. The original publication contained bibliographies of articles which appeared in the *Welding Journal* from 1937 through 1957. Each year a supplement is compiled listing the previous year's articles.

The Bibliographies previously issued listed articles under 28 subject headings. The current Supplement contains listings of all articles appearing in the *Welding Journal* from January through December, 1959. The complete Bibliographies thus provide a record of all articles on welding, welding research, and related subjects which have appeared in the Society's magazine from 1937 through 1959.

The Supplement has been designed for use as issued or as supplementary material to bring previously issued AWS Bibliographies up-to-date. The format is identical and entries under a given subject are contained on one or more pages. Each page is punched to facilitate insertion into the original Bibliographies under the respective subject headings.

The compilation of these data is performed as a service to industry to eliminate the time consuming examination of technical literature in the search for information on a given subject.

Copies of the 1959 Supplement to the AWS Bibliographies may be obtained at a cost of \$1.50 from the American Welding Society, Department T., 33 West 39th Street, New York 18, N.Y.

Manual of Bridge Design Practice

The Bridge Department of the California Division of Highways has published a uniquely complete and authoritative book entitled "Manual of Bridge Design Practice". Containing 638 pages (8½x11) it is divided into sections of Bridge Economy, Review of Moment Distribution, Bridge



Loadings, Slab Bridges (longitudinally reinforced), T-Beam Bridges, Box Girder Bridges, Simple Span Rolled Beam Bridges, Welded Girder Highway Bridge, Simple Span Composite Girder Bridge, Through Girder Railroad Bridge, Simple Span Deck Truss Bridge, Theory of Prestressed Concrete, and Design of a Prestressed Concrete Girder.

Each section describes the application of the theory, interprets the AASHO or AREA design specifications, and provides a complete step-by-step example of the design. Eight of the sections also describe the design of various types of substructures.

The information in this book was originally prepared in 1952 in typewritten multilith form as an in-service training program, in the California Division of Highways. It has been in use with occasional revisions ever since. The frequency of requests from individuals who have seen the material has prompted the division to make it available to others in the profession throughout the country.

This book is believed to be the only published work containing complete and practical procedures for the design of the usual types of bridges.

The "Manual of Bridge Design Practice" can be obtained from the State of California, Printing Division, Documents Section, North 7th Street and Richards Boulevard, Sacramento 14, California. Postpaid Price is \$12.50 per copy (\$13.00 in California, including tax, and \$13.50 outside the United States).

WELDED INTERSTATE HIGHWAY BRIDGES. A new book presenting a review of current bridge design practice on the Interstate Highway System; designs of 14 bridges are reviewed with brief discussion and actual drawings; bridge types including plate girder, box girder, arch and bascule; 269 pages, 200 of which are drawings and photographs, bound with a hard, board, gold stamped cover. Editor, James G. Clark. Publisher, The James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio. Price \$2.00, postage prepaid in the U.S.A., \$2.50 elsewhere.



Hydraulically controlled Model 210 A-W crane inches 18-in. cast-iron water main into position in San Diego County, Calif.

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New Publications

PROCEEDINGS—18TH SHORT COURSE ON ROADSIDE DEVELOPMENT. Issued by the Department of Landscape Architecture of Ohio State University and the Ohio Department of Highways, Columbus.

This 160-page illustrated compilation contains a score or more of papers and discussions from this Short Course which was held in October, 1959.

Readers interested in a copy should address W. J. Garmhausen, Short Course Coordinator, Ohio Department of Highways, State Office Building, Columbus, Ohio.

HIGHWAY PROGRESS, 1959. Annual report of the U. S. Bureau of Public Roads. 100 pages including an appendix containing 35 tables of basic data. Available at price 40¢ from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

BRIDGES: BEARING PADS, FOUNDATIONS, Scour and Waterways. Bulletin 242. Highway Research Board, 2101 Constitution Ave., Washington D.C. Price: \$1.40. This 77-page bulletin contains six research papers on varied bridge subjects presented at the 38 annual meeting of the Highway Research Board, January, 1959.

MICHIGAN EXPERIMENTS WITH SODIUM CHLORIDE STABILIZATION. Bulletin 247. American Road Builders' Association, World Center Building, Washington 6, D.C. Price 50¢ per copy or one copy free to ARBA members in good standing.

Written by R. L. Greenman of the Michigan State Highway Department, this bulletin describes an investigation to determine the value of larger amounts of sodium chloride for improving soil-aggregate mixtures.

SOIL STABILIZATION WITH ASPHALT, Portland Cement, Lime and Chemicals. Bulletin 241. Highway Research Board, 2101 Constitution Ave., Washington, D.C. Price: \$2.40.

This 126-page bulletin contains six papers dealing with stabilization of poor soils and presented at the 38th annual meeting of the Highway Research Board, as follows:

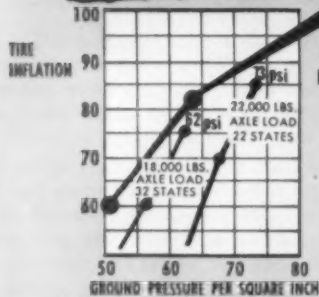
"Soil-Organic Cationic Chemical-Lignin Stabilization," by J. M. Hoover, D. T. Davidson, J. J. Plunkett and E. J. Monoriti.

"Water in Cutback Asphalt Stabilization of Soil," by R. K. Katti, D. T. Davidson and J. B. Sheeler.

"Chemical Treatments for Surface-Hardening of Soil-Cement and Soil-Lime-Flyash," by R. L. Handy, J. L. Jordan, L. E. Manfre and D. T. Davidson.

"Improvement of Soil-Cement with Alkali Metal Compounds," by T. W. Lambe, A. S. Michaels and Z. C. Moh.

This paper includes a
Continued on page 30



Tampo's rugged SP-900 self propelled pneumatic tired roller provides GREATER GROUND PRESSURE than truck load limits for MAXIMUM DENSITY rolling. Check current specs in your state.

Higher unit pressures (exceeding truck tire contact pressures) densify the mat beyond traffic stress, tighten surface structure, prevent traffic grooving, decrease raveling and seal longitudinal joints.



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As patching compounds and skid-resistant, road-surfacing materials, Guardkote resinous paving cements are giving outstanding performance at some of America's most critical high-maintenance traffic areas. For complete information about these new plastic paving cements, write your nearest Shell Chemical district office.

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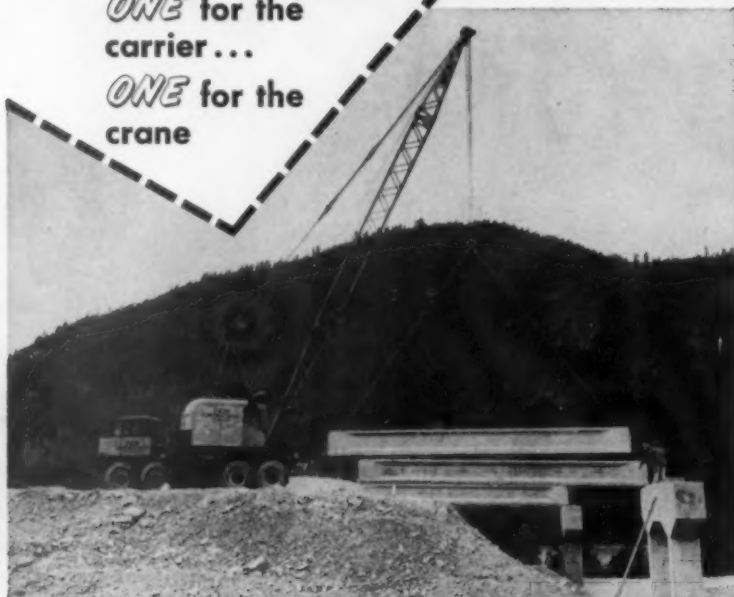
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TWO WAUKESHA ENGINES

ONE for the
carrier ...

ONE for the
crane

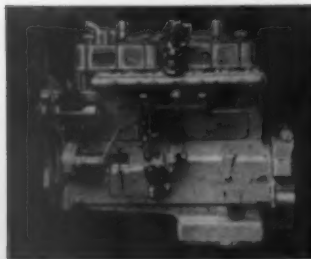


On new interstate highway near Tarkio, Montana—Pew Construction Co., contractors, of Missoula, Montana, are building overpasses for the Montana Highway Department, using an MC-530W Lorain truck-crane with two Waukesha Engines.

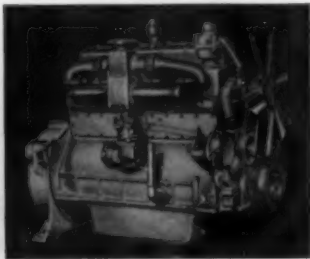
Setting prestressed concrete beams—40 to 45 ft. long, weighing $10\frac{1}{2}$ to $12\frac{1}{2}$ tons each—constructing highway-over-highway overpasses! And, lifting these beams on a radius of 32 ft., with a 65 ft. beam, the Lorain truck-crane did the job handily. Its crane engine, a Waukesha gasoline 135-GZB, has the sheer lifting power, and the quickly responsive, smooth power for maneuvering, with reserve power when needed. The carrier engine, a Waukesha gasoline 145-GKB, "has lots of power for the road" says the crane operator.

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Waukesha Gasoline, $5\frac{1}{4}$ -in bore x
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Max. hp 240 @ 2400 rpm.



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5-in. stroke, 451 cu. in. displacement.
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Publications

Continued from page 28

discussion by L. T. Norling and R. G. Packard, and a closure by the authors.

"Fine-Grained Soil Stabilization with Phosphoric Acid and Secondary Additives," by A. S. Michaels and F. W. Tausch, Jr.

"Use of Calcium Chloride for Soils Base Stabilization in Maryland," by J. Eldridge Wood.

TEMPERATURE IN BITUMINOUS MIXTURES: 1959 Conference discussions. Special Report 54, Highway Research Board, 2101 Constitution Avenue, Washington, D.C. Price \$1.00

This 40-page bulletin includes discussions that were originally presented largely without formal papers, at a session of the Board's annual meeting in January, 1959. The twenty-eight speakers and other participants discussed effects of aggregate temperature on properties of bituminous mixtures: temperature-viscosity relationships of asphalts: effects of asphalt cement viscosity at mixing temperature on mix properties: effects of time and temperature on hardening as asphalts: effects of pugmill structure and asphalt spraying mechanism on mixed properties and the effects of mix temperatures and of air and base course temperatures in placement.

EFFECTS OF TRAFFIC CONTROL DEVICES. Bulletin 244. Highway Research Board, 2101 Constitution, Washington, D.C. Price \$1.80. This 95-page bulletin contains five papers presented at the 38th annual meeting of the Highway Research board.

MIXED-IN-PLACE soil-cement street construction in North Dakota. Technical Bulletin 248, American Road Builders' Association, World Center Building, Washington 6, D.C.

This bulletin by A. J. Kovash,

Continued on page 34

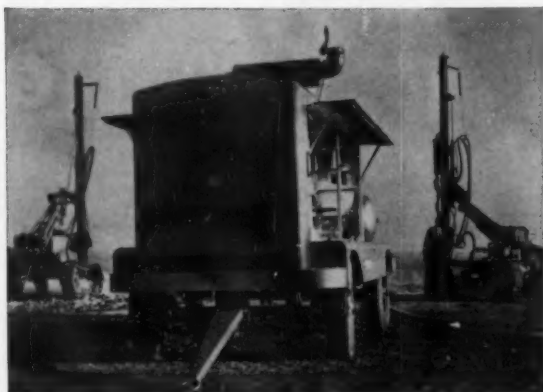
ROADS AND STREETS, July, 1960



TOUGH ROCK. On this Rocky Mountain excavation nearly all of the rock was badly fractured and schisted as well as being highly abrasive.

Bits lasted an average of only 15 feet. This job was done with crawler drills powered by a battery of Jaeger "600" compressors.

Jaegers cut air costs on tough 1,300,000 cu. yd. Rocky Mountain excavation



A Jaeger rotary "600", using the same GM 6-71 diesel engine as used in other "600" rotaries, delivers its rated capacity at 100 rpm slower speed — 1700 instead of 1800. In an 8-hour full-load operation, the Jaeger's engine does its work in 48,000 fewer revolutions.

Because it runs slower, it saves miles of engine piston travel and pounds of fuel every working day. The engine requires less maintenance . . . lives a longer operating life.

The compressor unit in a Jaeger lasts longer, too. 8000 hours without a vane replacement is not unusual. Ask any Jaeger owner; ask your Jaeger distributor — or send for new catalog JC-O.

← **LOW COST AIR FROM THIS "900", TOO.** The Jaeger "900" uses the same GM 6-110 diesel engine as other "900" rotaries, yet it produces its rated capacity at 100 rpm slower speed (1700 instead of 1800). Consequently, a Jaeger "900" produces more than 500 cf of air per pound of fuel. And it needs less maintenance, has a longer life. Other Jaeger models, from 75 to 365 cfm, are of comparable efficiency.

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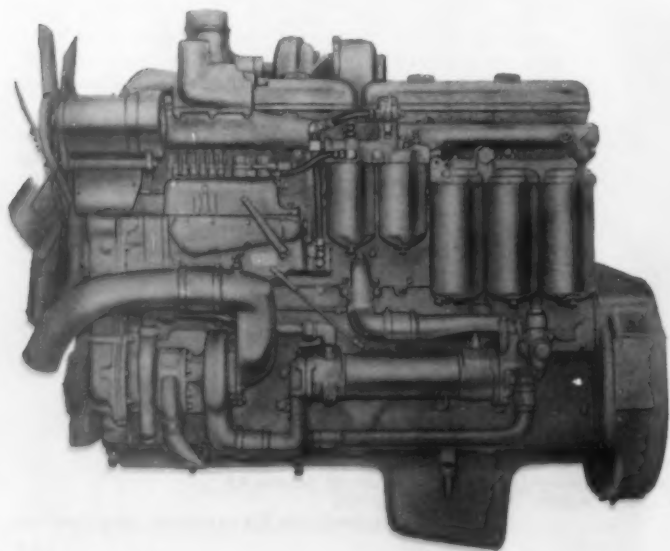
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How **BRAWN-BACKED** **Payscraper** features give you stepped up...loading

From power plant to push-block, the 34-cu. yd. International 295 Payscraper gives you an exclusive combination of features that step up dirt-on-fill delivery! Compare quiet, big-capacity DT-817 Payscraper power. Try the advantage of up or down, on-the-go, Payscraper power-shifting that provides load-speeding *automatic* direct-drive lock-ups in second, third, and fourth gears! Measure *extra value features* like safe, effortless power-steering—that leaves “the steering feel in the steering wheel.” Note how exclusive torque-cushioning planetary drive axles add dependability to rough-and-tumble earthmoving! See how 122-inch bowl width speeds loading and unloading—adds control ease and stability, loaded or empty. Prove on your job that bonus performance “rides” the Payscraper bowl. Choose the 2-axle “295”; or 3-axle, 34-cu. yd. “495.” See your International Construction Equipment Distributor for a demonstration.

Payscraper power-to-payload punch tops all other rubber-tired rigs—because the fast-slugging, high-torque International DT-817 diesel is the Payscraper power plant! The 375-hp, turbocharged DT-817 gives you direct, push-button starting; all-altitude high-efficiency performance; power for top rim-pull to help speed all steps of the cycle; time-saving “no-lag” control power!



...roading

...dirt-on-fill
capacity!



Even "dead" sand comes alive and "boils" fast into the Payscraper bowl. Every detail of Payscraper design aims at speeding the cycle, and staying available! The 21-inch diameter steel cross tube provides super load-bearing strength and resistance to impact. Bowl "back-bone," draft arms and side reinforcing members all are massive high-strength box-section steel weldments. "X"-member reinforcing maintains perfect push-frame alignment at all times. And the 4-speed, planetary-type, torque-converter power-shift transmission automatically adjusts torque and load to speed — to maintain full capacity!



You steer the 140,000-lb. loaded Payscraper almost as easily as a 3,600-lb. automobile! Payscraper gives the big control advantages of (1) exclusive International rack-and-pinion plus tandem pump steering system; and (2) 3-degree forward spindle pitch that improves scraper balance and prevents "nose downs" in high-speed turns. The 16-adjustment, bump-smothering seat builds operator confidence, too. And reach-easy power brakes, "control tower" vision, and flush deck safety help him deliver full Payscraper capacity, and take advantage of speeds up to 33.5 mph. He commands ample power and traction to pull directly out of 90-degree turns, even on soft fills!



The fast, positive-acting Payscraper ejector mechanism is powered by the International PTO-driven Cable Control Unit. One cable drum of this simple planetary system actuates the apron and ejector; the other drum positions the bowl to control spreading action. Apron lifts to a big 94-inch opening. Two ejector-plate pushing members apply dozer-like action to force out the whole 34-cu. yd. load cleanly. Action of six heavy-duty springs, stretched during ejection, positively powers the ejection mechanism's return!



Here's your 76-page cost and production estimating book—newest, most authentic and complete guide for estimating material-moving costs—and for selecting equipment combinations for top profits, anywhere! Yours for the asking from your International Construction Equipment Distributer!

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A Complete
Power Package

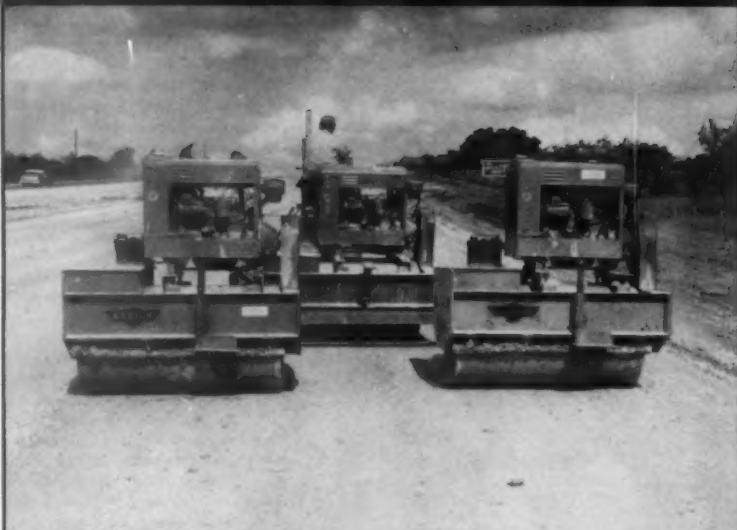


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ESSICK

VIBRATING COMPACTORS



COSTS DOWN—COMPACTION UP! WITH ESSICK 54" VIBRATING COMPACTOR

**CONTRACTOR REPLACES EQUIPMENT WORTH \$67,200 AND
DOUBLES PRODUCTION RATE—WITH HIGHER DENSITIES—FEWER
PASSES—HIGHER LIFTS**

On Texas State Highway 180, Fred Hall & Sons Contractor, were using two Model M tractors, three 10 ton pneumatics, one 3 wheel 10 ton roller, one 50 ton self propelled pneumatic, and one blade to compact crushed limestone with four different clay contents varying from 10% to 15%. They were having considerable trouble getting densities with 2" lifts and many passes of the 10 ton pneumatics, the 50 ton pneumatic on the third lift of 6", and a slushing and final rolling with the three wheel roller to slick off.

Three Essick VR-54 (54") Vibrating Compactors in triplex hook-up made two passes on the full six inch lift, with one more fast pass after a water slush to slick off. They got the required density of 140 pounds to the cubic foot, and increased material laid to twice the amount laid before. The three 54" Vibrating Compactors in triplex replaced \$67,200 worth of other equipment—reduced operating costs—and doubled the rate of production.

ESSICK VIBRATING COMPACTORS

In any compaction requirement, ESSICK High-Frequency Vibrating Compactors will cut costs, increase production with higher lifts, fewer passes, higher densities, at a greater profit. ESSICK Vibrating Compactors are constantly increasing the profit of thousands of contractors like Fred Hall & Sons and can do the same for you.

9 models of Vibrating Compactors from 13" to 72" widths



for compacting all types of fills, sub base, base materials, asphalt, and trenches

Also 14 Models of Tandem Rollers from 1/2 to 14 Tons.
SEE YOUR ESSICK DEALER FOR A DEMONSTRATION ON YOUR JOB

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Publications

Continued from page 30

of Kovash, Inc., Contractors, describes experience in the soil-cement construction field including a discussion of the equipment investment required and techniques employed.

Bulletin available at 50c per copy remitted to the Association, or free to ARBA members in good standing.

HIGHWAY STATISTICS, 1958. The Bureau of Public Roads, U.S. Department of Commerce. A 150-page bulletin, 14th in the annual series presenting statistical and analytical tables of general interest on motor fuel, motor vehicles, highway-user taxation, state and local highway financing, road and street mileage, and Federal aid for highways.

Available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., at \$1.00 per copy.

PROFESSIONAL ENGINEER'S EXAMINATION QUESTIONS AND ANSWERS. By William S. Lalonde, Jr., Licensed Professional Engineer; Chairman, Department of Civil Engineering, Newark College of Engineering; 2nd Edition. 615 pages, 5 1/2 x 8, 273 illustrations, \$7.50. McGraw-Hill Book Information Service, 327 W. 41st Street, New York 36, New York.

PUBLICATIONS OF THE HIGHWAY RESEARCH BOARD. January, 1960. A pamphlet listing several hundred available publications of the board together with their purchase price. Available on request from the Board, 2101 Construction Avenue, Washington, D.C., U.S.A.

DENSITY, ABSORPTION AND SPECIFIC GRAVITY TESTS of aggregates, bituminous materials, bituminous mixtures and surfaces. Bibliography 25, 2101 Constitution Avenue, Washington, D.C. Price 60c.

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For a better profit picture...

CHECK EUCLID C-6 WORK-ABILITY



You'll find this new C-6 has the all-around tractor versatility needed for heavy construction, mine and quarry work. With five years of rugged field and proving ground test, this new crawler sets higher standards of performance on the toughest jobs for tractors in the 200 h.p. class.

Here are just a few advantages you get in the C-6... a dependable GM 6-71 engine delivering 211 net h.p. to the power train... a proven Torqmatic Drive that provides full-power shift and cuts cycle time... fast-as-a-fox maneuverability... almost unbelievable ease of handling... accessibility for servicing that pays off in more productive time on the job. It responds like nothing you've ever touched!

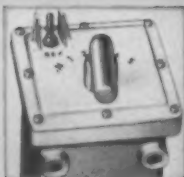
Have your Euclid dealer give you all the facts on the C-6... he'll show you why this new "Euc" belongs in your spread... why it's your best equipment investment.

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EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



SynchroTouch Transmission Control—optional on DW21 and DW20 Tractors.

NEW CAT SYNCHROTOUCH TRANSMISSION CONTROL STEPS UP PRODUCTION 10 TO 15%!

THE JOB: Site improvement for Marple-Newtown Jr. High School, Pa. Clearing and grubbing...cut and fill...moving 40,000 cu. yd. of dirt to level area around the school.

CONTRACTOR: Hugh Boyd, Inc., W. Conshohocken, Pa.

EQUIPMENT: Two Cat DW21G-470B units with SynchroTouch Transmission Control and one Cat D8H Tractor with Power Shift Transmission.

When this picture was taken, the job was 25% ahead of schedule. Owner Hugh Boyd gave most of the credit to his new Caterpillar equipment. He said: "The SynchroTouch Transmission Control on the DW21s increases production 10 to 15% due to faster operation and less operator fatigue. The Power Shift Transmission on the D8 cuts operator fatigue 30%, permits smooth contact with the scraper and takes it out of the cut in third gear with no hesitation to shift."

Have you checked what SynchroTouch Transmission Control can do for you? To shift gears, the operator simply dials the desired gear for automatic, split-second response. A standard foot clutch is used *only* when starting from standstill. Results: faster shifting for faster cycles and more payloads per hour. Lessened operator fatigue for more daily production.

Compared with previous models, the new 345 HP

... for more details circle 290 on enclosed return postal card

two-wheel DW21G and four-wheel DW20G Tractors deliver 12% higher rimpull producing up to 20% faster travel speeds under similar haul road conditions. Their new LOWBOWL Scrapers (470B and 456B, respectively) are rated at 19.5 cu. yd. struck; 27 cu. yd. heaped. With optional SynchroTouch Transmission Control, they're designed to move more dirt faster and cheaper than any competitive unit. Ask your Caterpillar Dealer to show how he can step up production for you!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**BOOST PRODUCTION
WITH SynchroTouch
TRANSMISSION CONTROL**

The Road Program's Best Friends

The best friends of the cause of a strong and continuing highway program are, or should be, the members of the press. Newspaper editors and feature writers and representatives of radio and TV in your state are the people who mold grass roots opinion. And grass roots support that can be heard in Washington is the goal of everyone concerned with seeing the National Interstate Highway Program pushed vigorously to completion in the public interest.

An excellent demonstration of how to get the press more interested was staged in Tennessee recently. Governor Buford Ellington declared May 20-26 as Tennessee Better Roads Week. The Tennessee Road Builders Association, under executive secretary Leslie Hart, organized an 800-mile plane tour of the state's Interstate highway projects for two score reporters and cameramen representing the larger city dailies, radio and television stations.

The one-day tour using eight twin-engine private planes lent for the occasion took the observers over all the active projects on the state's 1,000 miles of "I" routes. An hour's bus tour around Chattanooga gave the visitors a chance to dig their toes into fresh grade and ask questions. Kits of factual data were also supplied. The next day virtually every Tennessee daily newspaper and air station carried stories. Large front-page pictures helped tell the status and progress on the "I" projects.

The noteworthy thing was the public relations savvy shown in handling this junket. Leslie Hart, himself a veteran newspaperman before taking his present job, wisely refrained from haranguing the reporters with arguments. The aim was to let them see for themselves, ask questions, read up on available

facts, and turn in their stories as they felt the stories should be told.

Some of the news reports were critical, some raised questions, but practically all pointed to the need to finish the job. The week's publicity left citizens much better posted on their road program—what the Interstate system is all about, how far along it is, why it hasn't gotten farther, and the importance of completing the present dead-ended fragments so that the state's transportation can leap forward.

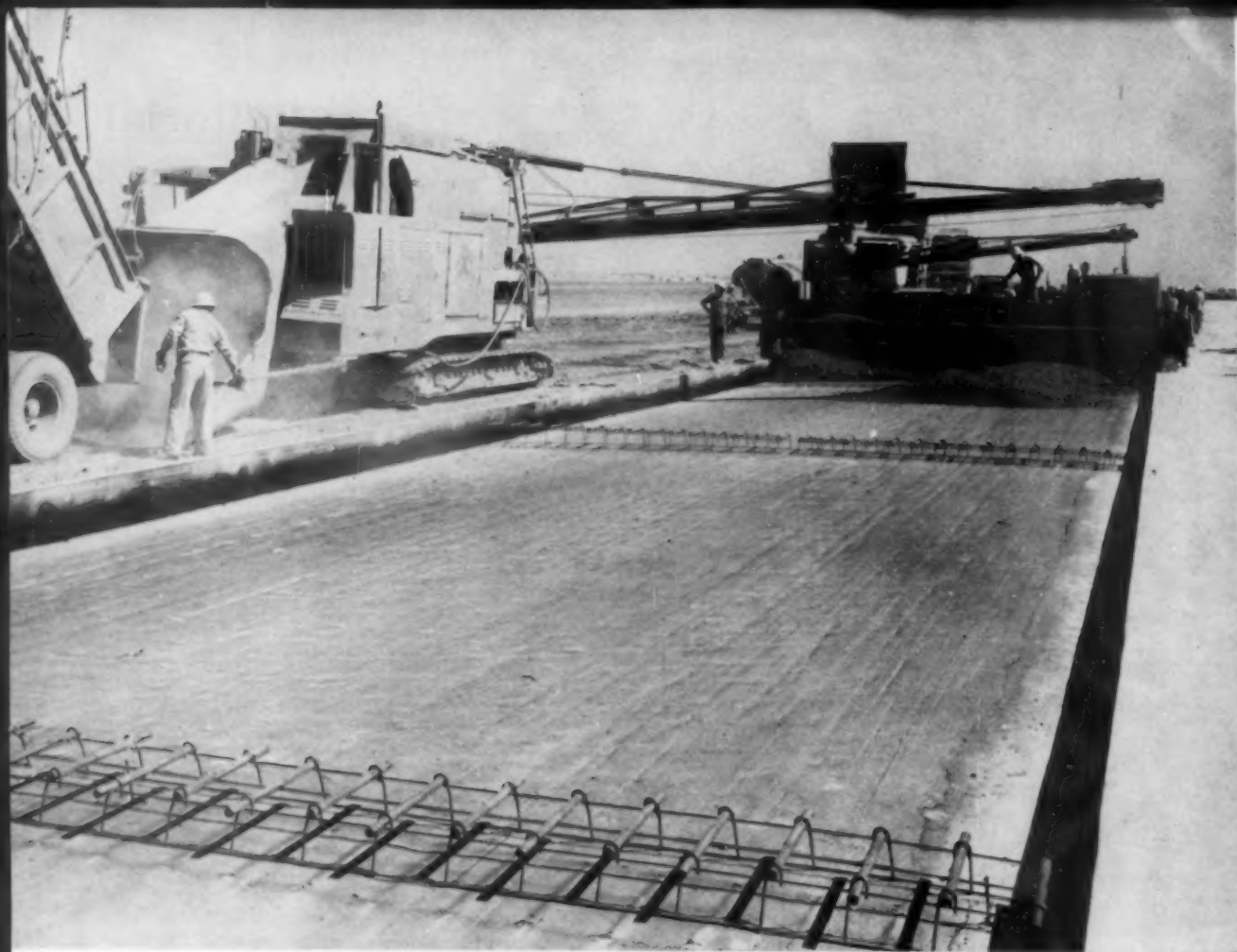
Some of the reporters had never really stopped to consider, for example, why cloverleaves and overpasses are necessary, or why access control is so important. Or why entirely new direct alignment is desirable to bring the state's areas closer together. These life-saving, time-saving, industry-promoting features will be better understood by Tennessee people—and the value of this new super-road system to rural and city people alike—as a result of this stimulating tour.

A related significant point in the Tennessee picture: the local road builders association openly and straight-forwardly is in there pitching. In other states, such groups have been self-defeating by trying to do all the talking and by presenting empty arguments rather than serving as a source of accurate and trustworthy data.

Tennessee represents the average state. Its people are divided, some for and some against the Interstate road program and many, all too many, just plain apathetic. Tennessee's progress will be worth watching in other states where the highway education effort hasn't as yet gotten off the ground.

Don't forget your newspapers and air stations. You can't do it without their active, continuing support.

Harold J. McKeever



Delivering 2 batches per minute, the Tribatch regularly turned out 30 percent more material than its 34-E team mate in laying the first 9-in course.

Triple Paver Keeps Runway Pours in Balance

The new triple-compartmented drum paving mixer recently on the market has proven itself on its first sustained paving job. Working with two conventional dual-drum pavers under excessively hot, dry and dusty conditions in the Yuma Desert in Arizona, a Koehring Tribatch paver more than lived up to expectations. In accordance with its announced machine produced 30 designer's purpose, this recently-percent more batches per hour than the conventional 34-E dual-drum.

The new paver is part of the train used by the joint venture of Sundt & Bevanda (M. M. Sundt Construction Co. of Tucson; M. J. Bevanda Co. of North Hollywood,

The Tribatch operator is responsible only for bucket and boom travel and movement of the paver. All mixing and cycling operations are automatic, and an automatic tripping skip is reset after each load by a batch truck control man.



Towed behind the first spreader, cart for carrying reinforcement panels, up to 10 tons of Colorado Fuel & Iron reinforcing mesh. Two steel workers flip the mesh atop the steel roller running across the back of the cart, then roll it onto the first lift.



Calif.) for a 13,300 x 200 ft. runway and associated taxiways at the Marine Auxiliary Air Station near Yuma, Arizona. The paving totaling 170,000 cu. yd. of concrete is the major part of a \$4,119,000 Navy contract now largely completed.

A succeeding report will describe the base construction including the 6-in. soil-cement processing. This review covers the concrete pavement.

All taxiways and the 1,000-ft. runway end zones are 13-in. thick concrete and include fabric reinforcement. In these reinforced areas two-lift pouring was pursued to facilitate placement of the reinforcing, and it was in keeping the first 9-in.

lift progressing rapidly that the Tribatch made its most impressive contribution.

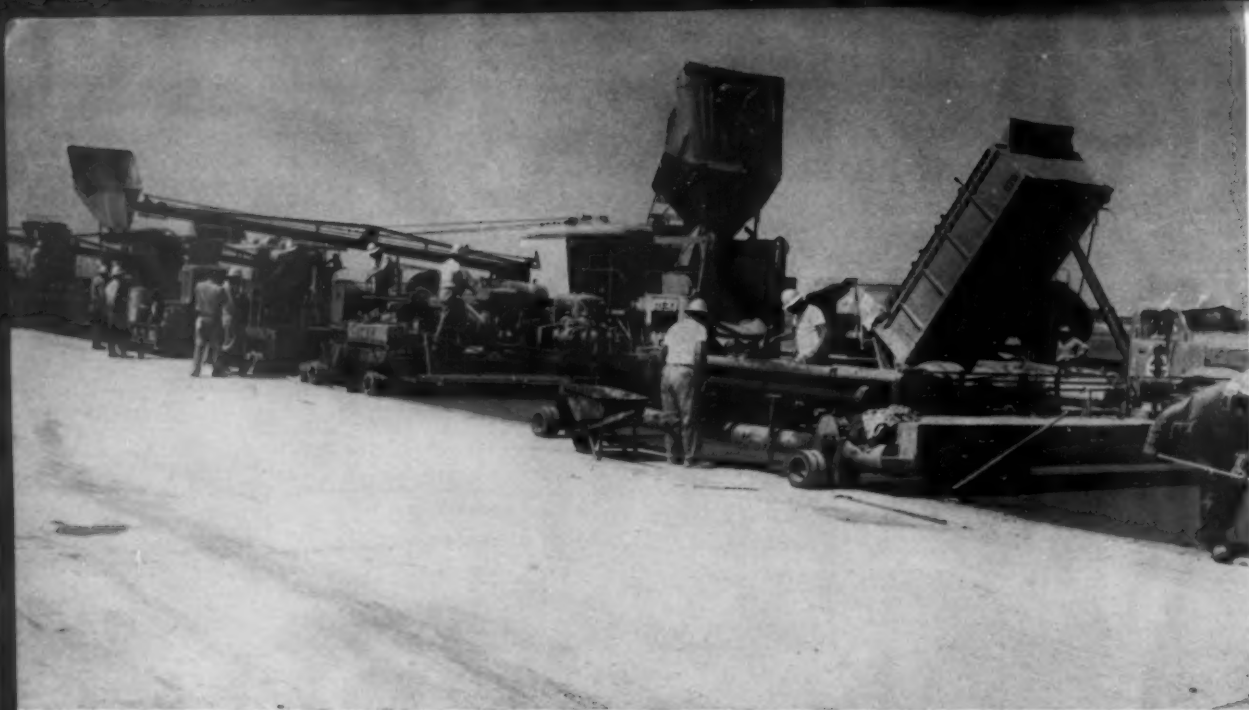
Supply and Hauling. A Noble one-stop batching plant was set up at midpoint along the job. Aggregate was trucked from an erected plant for this particular job 14 miles away. Type 2 low alkali cement was brought to Yuma by rail, unloaded at a 1,600 bbl.-per-hour transfer plant, then transferred by truck tanker to two 1,200-bbl. silos at the batch plant.

Water for soil-cement processing and paving was drawn from a nearby irrigation system, then transferred to a 1/2 million gal. storage pond, as a cushion against disruption

of irrigation supply. A pump from this pond fed a 20,000 gal. storage tank erected near the batch plant, used to fill tanker and spray trucks.

By placing the storage tank in the batch plant area, Sundt & Bevanda was able to establish one main route for all major supply equipment moving in and out of the operational airport area. This eliminated the amount of road maintenance work required as well as reducing the confusion and the chance for accidents.

The longest supply run was 2 1/4 miles from batch plant to pavers. The 13 dump trucks, each with five 1.42 cu. yd. compartments, could



The complete paving train. For lower lift, the Koehring Tribatch and a Rex dual-drum paver, a modified Blaw-Knox spreader, and cart for reinforcing. For top lift, a second Rex dual-drum paver, spreader, two finishing machines, vibratory joint machine, longitudinal float, and (not shown) membrane spray machine.)

just keep the "supply pipeline" full on this longest run. Water—over 147,000,000 gal. of it for the job—was delivered to the pavers by three specially constructed 5,000 Euclid tank trucks.

Paving operations, following closely behind soil-cement work, circled in 25 ft. lanes working out from the runway center. The Tri-

batch paver and a Rex dual-drum paver placed the first 9-in. lift, which was struck off by a Blaw-Knox spreader modified by Sundt & Bevanda through installation of a 37.5 KVA Cat diesel electric unit and ten Viber vibrators.

Towed by the spreader was a 10-ton capacity reinforcing steel cart constructed by Sundt & Bevanda for

this job. The reinforcing steel mesh stacked on the cart was pulled over a roller bar running across the rear of the platform by two steel workers who positioned it on the freshly struck-off concrete. An interesting feature of the cart was the use of surplus track idlers from M-4 Army tanks. The idlers were modified by

Continued on page 87

(Left): Expansion joints at 225 ft. spacings: 1¼ in. dowels at 10-in. spacing, with alternate dowel ends in sleeves. Asphalt impregnated ¾-in. fibreboard is part of Universal assembly. (Right): Spreader for striking off at reinforcing level, modified by addition of 37.5 KVA Cat diesel electric unit and 10 Viber vibrators.



Analyzing the Job for Top Scraper Production

**Standard or optional higher gears?
Sideboards? Spend to improve haul
roads? This procedure shows which
scheme is best for given conditions**

By R. L. Peurifoy,
*Construction Consultant,
Bryan, Texas*

Naturally you'd like to reduce the cost of handling earth on your next job.

Well, it probably can be done.

First, you must obtain complete information on the job conditions, including the kind of material to be handled, the length, slope, and rolling resistance of the haul road, probably weather conditions, altitude of the job, etc. All of these factors will influence the performance of your equipment. Next you'll need to analyze this information in conjunction with the performance data for the equipment you own or plan to purchase for the project.

The results of such a study may be quite gratifying. Manufacturers are constantly making bigger and better earth moving equipment—machines which, if properly selected and used, will reduce the cost of handling earth. This is especially true of tractor-pulled scrapers, with many types and sizes available. A contractor may increase the production rate of a unit by changing to a larger scraper, without increasing the size of the tractor. He may specify a tractor with optional gears to permit higher operating speeds.

Or he may increase the capacity of a scraper by adding sideboards; or—as has been done in some instances—he may lengthen the bowl to increase the capacity.

The important thing is that he should study each of these possibilities, and probably others, in order that he may select the equipment and methods that will move the earth at the lowest cost. Fortunately, such studies will produce results that are reasonably accurate, if sufficient information is available concerning the job and the equipment under consideration. Several analyses will be made to illustrate the procedure that should be followed.

The procedure applies to highway grading, or any earth moving. For this study consider a project which requires the construction for example, of an earth dam, for which the following conditions will apply:

Elevation, 800 ft. above sea level.

Volume of earth, 3,000,000 cu. yd., bank measure.

Swell, 33 percent.

Weight of earth, 3,220 lb. per cu. yd., bank measure.

Loose weight, 2,420 lb. per cu. yd.

The borrow pit, large enough to permit efficient operations.

Average length of haul, one mile.

Haul road, level, well maintained, with an average rolling resistance of 65 lb. per ton.

Required rate of production, at least 620 cu. yd. per hr., 20 hr. per day, for 240 working days.

The earth will be loaded and hauled with four-wheel-tractor-pulled scrapers. Crawler tractors will be used in the borrow pit to assist in scraper loading. The specifications for this equipment are as follows:

Wheel tractors:

Engine, 345 hp, maximum output (1)

Operating weight, about 28,000 lb.

Table 1 gives performances using standard gears.

Table 2 gives performances using optional gears.

Scrapers:

Struck capacity, 19.5 cu. yd.

Heaped capacity, using 1:1 slope, 27 cu. yd.

Heaped capacity, using 3:1 slope, 21.4 cu. yd.

Load capacity, 58,500 lb.

Weight, 30,800 lb.

Crawler tractors:

Engine, 335 hp, maximum output (1)

Operating weight, about 61,300 lb.

Continued on page 78



Believe it or not—this is a model. Complexity of the "spaghetti bowl" interchange involved made this \$17,000 scale model a time saver for planning the \$9.5 million job.

Model Helps Kiewit Plan Complex Job

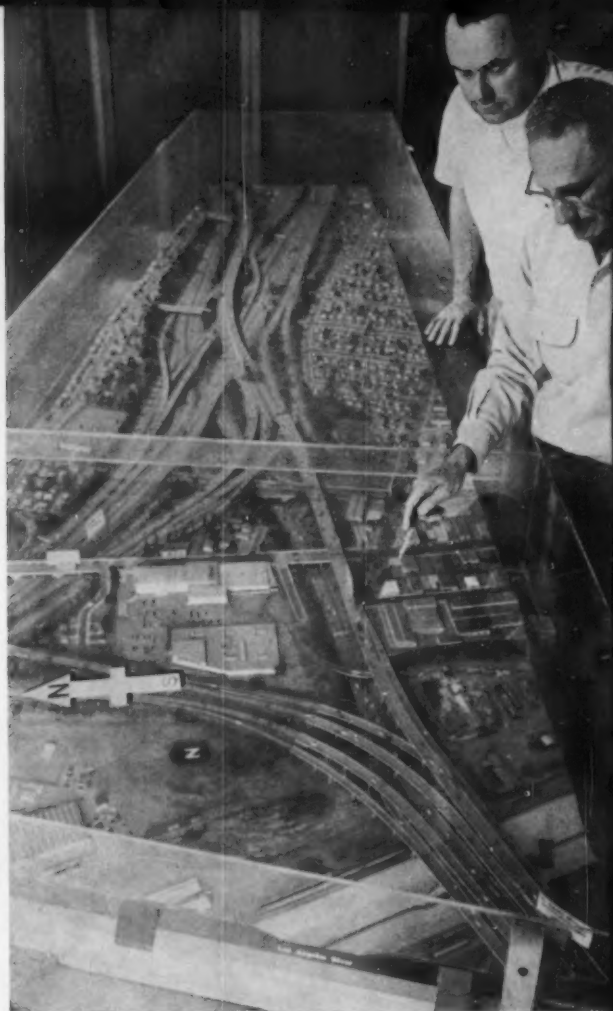
A \$17,000 model of the "spaghetti bowl" interchange between the Santa Ana, Golden State, Pomona and Santa Monica Freeways in East Los Angeles is being used advantageously by Peter Kiewit Sons in mapping haul routes and orienting job foremen on this highly complicated \$9.5 million project.

The 1":50' scale model is large and exact. Each leg of its "L" shape is 4' wide and over 10' long. Made of wood and putty, it includes replicas of all residences and major buildings in the interchange area. It is rendered life-like with the addition of 2,000 cars, trucks and busses on the highways, trees and shrubbery on the surrounding hillsides, and faithful coloring.

Built in Sacramento by the Highway Division's Bridge Department, the 700 lb. glass encased unit can be disassembled for shipping. Peter Kiewit Sons' Co., contractors on the \$9.5 million interchange job, thought so much of the model's potential as an aid to job planning that they erected a separate building to house the model on the project. The building is enclosed within a tall chain link fence as an added security measure.

"We use it continually in planning our moves, orienting our foremen and checking traffic routing," reports job superintendent Norman Barnes in explaining the decision to house it on the job site. "It was particularly helpful in early stages of the job—before

Continued on page 102



Project superintendent Norman Barnes of Peter Kiewit Sons' (rear) and state resident engineer L. E. Steele study the plexiglass-enclosed east Los Angeles interchange model, preparatory to re-routing of traffic for movement of structural steel bridge members.





Eight planes were lent for the tour by contractors and other industry leaders. The 800-mile all-day tour was an "easy swing around."



On the ground, the newsmen were given a closer look at features of projects under construction or recently completed.



Road Builders Sponsor Unique Aerial Press Tour

Roads and Streets Staff Report

Tennessee daily newspapers recently had a lot to say about the Interstate highway program in their state. Front-page stories, with aerial photos at times, discussed and re-discussed the program's status, progress, and importance to motorists and citizens generally. As a result, Tennessee people definitely have gained a better understanding of what Interstate highways are all about.

This publicity didn't just happen. It came during the week of May 20-27, which was proclaimed by Governor Buford Ellington as "Tennessee Better Highways Week." That alone would have generated no particular interest or publicity. What sparked the rekindled interest in highway affairs was a rather unusual "see for yourself" press tour. Eight private plane loads of newspaper reporters, photographers and representatives of radio and television stations spent a beautiful summer day in the air. What they saw literally was an eye opener. The front-page stories, editorials and coverage by radio and TV followed naturally.



Example of what the newsmen saw from the air during their tour of Tennessee Interstate highway projects. This dead-ended segment dramatically showed the start made, the work yet to be done before the new freeways can fully serve the state.

The press party was organized and sponsored by the Tennessee Road Builders Association under the direction of Leslie T. Hart, its executive secretary, himself a former newspaperman. This chapter member of the American Road Builders Association has been one of the live-wire contractor groups.* The tour was held on a Wednesday. This day fitted in well with the newsmen's weekly cycle of reporting for both daily and Sunday editions. Also it was the day prior to the Association's annual summer luncheon meeting in Nashville, which as usual included a nationally prominent speaker and a full house of contractors in town for a big Friday letting.

The mechanics of the air trip are of interest. Twin-engine planes owned by contractors or industry supply companies were made available for the day. Each plane had a professional pilot who was thoroughly familiar with Tennessee and the highway locations to be visited.

*See "Road Work is Rolling in Tennessee," *Roads and Streets*, September, 1958.

Following a 7 a.m. breakfast at Nashville, the 35-man party took off on an 800-mile circle itinerary. The planes were routed over each of the eight areas of the state where Interstate highway construction projects are started or done.

In each plane a spokesman tried to answer questions as the newsmen brought them up. The pilots dipped low over the jobs, often circling and going by again to help cameramen.

Seen during the day were short segments of completed freeway, dead-ending dramatically against wood lots—mute testimony of work yet to be done.

The viewers saw rock drills at work in big cuts, scrapers filling across valleys, bridges and cloverleaves in all stages of construction, paving work in places.

They also saw that the Tennessee highway authorities had wisely started projects in each part of the state, so that citizens in the area could soon benefit. And that the jobs are balanced between urban and out-in-the-country.

At Chattanooga, a chartered bus whisked the party

Leaders in Tennessee "Better Roads Week": Leslie T. Hart, executive secretary, Tennessee Road Builders Association; Buford Ellington, Governor of Tennessee; J. Paul Nickell, president of the Tennessee Road Builders.



off for lunch and an hour's tour of local freeway projects. A state highway department or contractor representative with loud speaker explained things seen and answered questions. The visitors got dust on their shoes, took pictures, scribbled notes, asked about the big machines and geometric features, and soon the party was back in the air. A cocktail hour and dinner back at Nashville wound up the day.

The kit given each man helped make the day resultful. This included a map showing the location of the jobs seen; a copy of the Tennessee Highway Construction Report, listing the state projects under construction; a statement on Interstate highway design standards; a printed booklet on the state's road program; and a stapled report giving Interstate highway statistics and details.

The outline of design standards told in 2,000 simple words the "why" of dual roadways, access control, grade separations and other features of the Interstate highways. This statement provided much "lift out" material for the pressmen.

Another noteworthy item in the kit was the specially prepared, stable-bound folder entitled simply, "Interstate Statistics." It contained a letter of welcome to the tour delegates by J. Paul Nickell, president of the contractor association. Nickell said, "We want you to see the work now in progress on the big Interstate program and we will welcome your questions about the various jobs . . . We want you and the public to know the whole story about the road program."

This letter went on to note that Tennessee's Interstate program thus far included 52 projects awarded at a cost of \$106,364,000 for 188 miles of highways in Tennessee's ultimate 1,000-mile-plus Interstate grid.

Next in the binder came a letter of proclamation by Governor Ellington naming "Tennessee Better Roads Week." Then followed detailed project data—bid quantities and prices on each job seen and also a

layman's explanation of the abbreviated terms used (such as Clg. & Grb: "Clearing and Grubbing, a term covering removal and burning of trees, brush, stumps, from within the right-of-way as a necessary preliminary step in highway construction").

One other kit item was an attractive printed booklet entitled "New Lifelines for Tennessee—Facts About Your Tennessee Super Highways." Prepared by the Tennessee Road Builders Association as a public service, this 32-page booklet contains a wealth of readable information dramatized by map sketches, diagrams, charts and photographs. Its subtitle: "What the New Highway System Means to Every Tennessean."

The good from this day's tour can never be completely told. The immediate results were indeed heartening. Examples of front page stories and editorial comment by large city dailies are glimpsed herewith. The radio and TV coverage was equally good. The day's effort, in short, was a definitely successful one.

The Better Highways Week was given a further rounding out on the following day, Thursday, when the Association's contractor members gathered at a luncheon in the grand ballroom of Nashville's leading hotel. Governor Ellington introduced the feature speaker, Nello L. Teer, Jr., of Nello L. Teer Company. This North Carolina contractor, who is president of the American Road Builders Association and a founder of the Better Highways Information Foundation, made further front-page headlines with a factual review of the status of the highway program. He defended the program against its critics, explained the present lag in financing, and gave the reasons why Interstate costs have exceeded the original estimates. Teer's talk was in the spirit of the association's entire promotional effort, in that it gave actual information which the press could use in helping further public understanding of the Interstate highway program.

MILE-HIGH CALIFORNIA ROAD JOB

NEW TRACTOR- REALLY



Packs it in—two D8H Tractors, pulling and pushing, fill a 491 Scraper with hard-to-load breccia, a cemented gravel, in 45 seconds.

SCRAPER TEAMS PRODUCE

"A GOOD COMBINATION FOR THE ROUGHEST WORK"

TAKE boulders, volcanic ash and mud—mix well with decomposed shale—then add mile-high working altitudes, side-hill operation and unfavorable weather . . . these are some of the problems facing A. Tiechert and Son Inc. as they push a new highway through the Sierra Nevada Mountains in Eastern California. The job, 7.8 miles of freeway construction on State Highway 40, involves moving two million yards of earth in two five-month seasons. In spite of the obstacles, the Sacramento contractor holds the work to schedule, expects to complete the job on time this October.

Four D8 Series H Tractor-491 Scraper teams, push-loaded by D8s of the same series, set the pace for this difficult job. Because of the steep hill haul roads, they start the cuts and fills, then handle earthmoving on hauls up to 700 feet. DW21 wheel units take over on the longer hauls that range up to 7000 feet.

"The 491 Scrapers with D8s front and rear performed very well—especially in wet, rocky ground," says W. W. Staring, Project Manager. And he adds, "Operators and foremen especially like the 491 in rock because of higher apron clearance, excellent ground clearance and the good distance from axle to apron. In most cases we used D8-491 teams instead of shovels on shot breccia. It's a good combination for the roughest work."

On rugged big volume, short haul operations like this, Caterpillar track-type Tractor-Scraper combinations are the most efficient way to move earth. The new D8 Series H, for example, is over two tons heavier than the previous model, packs 23% more horsepower (235 flywheel HP), and with direct drive has a speed of 6.3 MPH forward. Team it with the 491 Scraper

. . . for more details circle 291 on enclosed return postal card



The finished product—traffic moves with speed and safety over a newly completed section of California State Highway 40.

(34 cu. yd. heaped, 27 cu. yd. struck) or the 463 Scraper (28 cu. yd. heaped, 22 cu. yd. struck) for big capacity loads.

Get all the facts—plus a profit-proving demonstration—on the new Caterpillar D8H Tractor and the 491 Scraper from your Caterpillar Dealer. He's ready right now!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**BORN OF RESEARCH
PROVED IN THE FIELD**



Closest Inspection Control Needed for Rock Fills

**Three state highway leaders agree
on one ingredient: field judgment.
Second in a series on rock and mixed
material embankments**



Getting Quality Construction in the Highway Program

The mixture here probably will make excellent embankment—but will need constant inspection control. This mountain road job with 1,000,000 cubic yards of excavation and very deep sidehill cuts is of the type that has focused fresh attention on rock filling methods. International TD-24 tractor and Model 65 Payhauler shown.

COLORADO

By W. J. Walsh,

Staff Construction Engineer,
Colorado Department of Highway, Denver

Our inspectors have no special instruction for fill construction other than to see that specification requirements are obtained. Tests for compaction are taken during the progress of the work to insure that density requirements are being met.

Embankment does not carry any classification as such, but is made from suitable material as obtained from unclassified excavation. The exception to this is where we call for rock fill in lieu of riprap. When materials are composed of a high percentage of large rock, we find that the provisions for placing as covered in Colorado specification

CALIFORNIA

By M. Harris,

Construction Engineer, California
Division of Highways, Sacramento

The first and most important step in obtaining a satisfactory embankment is securing an adequate foundation. If there is any doubt as to the supporting value of an embankment site, a field inspection is made and borings are taken. If necessary, corrective measures are designed to minimize settlement. These measures generally consist of construction of a stabilization trench, vertical sand drains, stripping to remove unsuitable material which is replaced with suitable material, or placement of a surcharge on the fill so that settlement will occur before the pavement is placed.

WASHINGTON

By E. C. Simpson,

Construction Engineer, Washington
State Highway Commission, Olympia

Construction methods used for projects involving rock and mixed material embankments in most cases, must be keyed to the individual situation existing on a given project. However, we will attempt to summarize for you our general specifications which apply to all rock embankments, and then point out some of the special procedures we sometimes find necessary.

Our standard specifications define a rock embankment as being all or any part of an embankment constructed of material containing 10 percent or more of gravel or stone 4 in. or greater in diameter. Please note that this specification

Colorado *continued*

15.1.10 are very important. This reads, "Embankments being placed with truck type hauling equipment shall be constructed in layers by dumping each load of material on the layer being constructed and blading the material into position with bulldozers or similar equipment to produce a fill of uniform density." By this method the large rock rolls to the bottom of the lift and the fine particles follow, filling the voids, and providing cover over the coarse material.

We do not specify the kinds of rollers to be used on any class of material, but in the case where rock and fines are from one source of excavation, we believe that vibratory type of equipment is very efficient for working the fines down into the open spaces and in keying the rock particles. We do not have a specification requiring fine material as a carpet for equipment over rock layers, but sufficient fines are required to fill the voids. Contractors, of their own volition, will attempt to distribute the fines material over the top to provide a fairly smooth haul road for their equipment. In cases where the rock is fairly soft, contractors will use sheepfoot rollers to help break down the coarse particles.

We have no positive means for determining if rock fills are thoroughly keyed and voids completely filled. With the type of equipment in use today, vibration and compaction are fairly well accomplished if care is taken in depositing the material so that settlement of embankment does not occur to the extent that it did formerly. However, we are sometimes troubled by slip-outs. These can be prevented to a large extent on sloping ground if drainage is provided to carry off underground water. Unfortunately, such conditions are not always discovered in the preliminary investigations.

When the natural ground has sufficient stability, we compact the areas underlying the embankment to the same density as specification for the fill. This is done to 1-ft. depth. In the case of deep fills, the super-imposed load will, in all probability, compress the natural soil to the same or greater density achieved in the fill. Where soft,

California *continued*

Section 19-6.01 of our earthwork specification also requires that existing natural ground be cut into a minimum of 6 ft. horizontally where embankments are placed on hillside areas, so that there will not be a zone of uncompacted top soil between the hillside and new fill.

Layer thicknesses and methods of construction, as well as compaction requirements, are covered in Section 19-6.02 of the specification. We classify embankment material only by rock content as per specification.

Compaction testing is done in accordance with the California Impact Method of Compaction Testing. This test is probably better than most compaction test methods for rocky material because rocks up to $\frac{3}{4}$ in. size are used in the test and a correction factor is applied for rock over $\frac{3}{4}$ in. However, as the rock content of the embankment material rises, a point is reached when there is insufficient fine material to test properly and test results become erratic. Proper compaction is then dependent on the zeal of the inspector.

Our earthwork specification is an end-result type, and it is the contractor's prerogative to use the type of compacting equipment that he desires. This usually consists of using rubber-tired, sheepfoot, or segmented compactors on material with a small rock content, ranging to manipulation with a bulldozer and watering heavily to wash fine material into the voids on material which is predominately rock.

Our success in rock embankment construction is probably attributable to the fact that test methods are erratic in rocky material and our inspectors give more time and effort to obtaining satisfactory results when this material is used.

mucky soils are encountered, we remove these and backfill with stable materials. When the depth of muck makes removal uneconomical, we use a displacement method by hauling in materials of high stability and in such quantity that a supporting foundation is obtained. We have had no experience in extremely deep conditions of this kind where perhaps vertical sand drains with lateral weeps would be required.

Washington *continued*

does not limit rock embankment material to solid rock excavation sources. This specification is based on our recognition that the compaction of such coarse granular materials cannot be measured accurately by standard field density control tests. In lieu of field density test control, we specify a given minimum compaction procedure that must be used for rock fills.

The standard specifications require that rock embankments be constructed in layers not exceeding 18 in., except that when the average size of the fragments exceeds 18 in., the layers may be as deep as required to allow their placement. Occasional fragments larger than the average size must be disposed of as directed and not incorporated in the embankment. Loaded and unloaded hauling equipment must be routed over the entire embankment width, and in addition, each layer must receive at least one coverage with a 50-ton roller or four coverages with a 10-ton roller for each 6-in. layer or fraction.

Intermediate-weight rollers are assigned a proportionate minimum amount of coverage required.

The rock material must be placed and evenly distributed with the finer material filling the voids to form a dense, well-compacted embankment. Fine material having a maximum size of 6 in., obtained either from the roadway excavation or from a borrow source must be used to top out the upper 12 in. of the rock embankment.

To supplement these standard specifications, and where considered necessary due to the nature of the rock embankment material, we may specify the use of a grid roller to break down and knit the rock fragments together, either on all lifts, or on the top lift. On other occasions we might require using alternate layers of different materials, require vibratory compaction, or other means deemed necessary to get the type of fill we want.

In closing, we consider the most difficult rock embankment to build properly is from solid rock excavation that rips or breaks into a one-size dice rock material. With these materials we attempt to supplement our specifications with grid rolling or additional material.

Now, you can drastically cut your trucking costs thanks to GMC's **BIG BREAKTHROUGH** in engine, chassis and cab engineering. We urge you to compare GMC's genuine truck value . . . feature for feature . . . dollar for dollar. Check with your nearby GMC Dealer listed in the Yellow Pages for actual proof.



New, distinguished GMC Conventionals are smashing sales records everywhere. And no wonder, look at the extra value and uncompromising ruggedness you get in new GMC pickups. Bigger, stronger cabs. Easier-handling, smoother-riding trucks. Road-tried, test-proved, exclusive V-6 power for lasting, low-cost performance. From 34 combinations, you can get the pickup you actually want and need.





Superior performance, big payloads and low-budget operation are the reasons new GMC Ninety-Inchers are fast becoming contractors' favorites. Power is the exclusive, extended-life V-6 or Twin-Six gas engine, or today's modern diesels—6V-71 Series. A demonstration on your toughest job will be convincing proof.

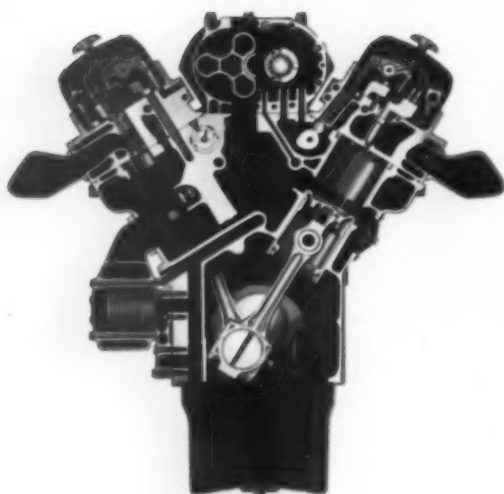


PULL
HERE

Join the contractors that are profiting from the many advanced features of the new GMC steel tilt-cabs. BBC is only 72 inches and axle set-back 52 inches — the preferred dimensions to haul more weight, more volume . . . more profitable payloads. You also get superior performance, extremely short turning and big safety vision. Choice of V-6, Twin-Six gas power or V-6 diesels in models from 19,500 lbs. GVW to 76,800 lbs. GCW.

**MEN WHO KNOW
TRUCK COSTS
ARE BUYING GMCs
FOR GREATER
TON-MILE PROFITS!**





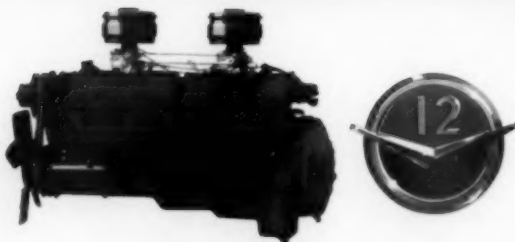
MORE RESPONSIVE, SMOOTHER POWER! NEW GMC V-6 DIESELS

Contractors "working by the clock" praise the instant throttle response and steadier flow of power from GMC's 2-cycle design. You get power on *every* downstroke. There are no wasted strokes or power lags. This work-proved 71 Series gives you more power per cubic inch displacement, more power per pound and more power per dollar!

CHOOSE FROM THESE EFFICIENT, FUEL-SAVING DIESELS

Model	Max. Torque	Max. Horsepower
6V-71	577 @ 1200	189 @ 1800 210 @ 2100*

*No extra cost



MOST PULLING POWER YOU CAN GET! TWIN-SIX

Exclusive GMC Twin-Six engines are giving truck owners the greatest load-moving power of any standard gas engine. This is lasting power, too. Maximum governed engine speed is only 2400 rpm. Low-stress, easy-stroking speed greatly extends engine life and reduces operating costs.

NEW TWIN-SIX FOR PROFIT-PERFORMANCE ON ALL HEAVY HAULS

Model	Gross Torque Range	Max. Horsepower
702	625-630 @ 1400-2100	275 @ 2400

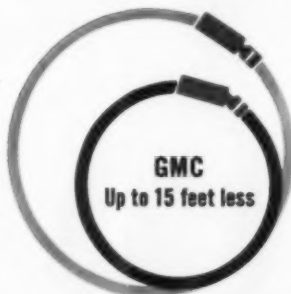
Full, rigid crankshaft support! Notice the full 3-inch extended GMC skirt for rigid crankshaft support. New compact design, extra-strong inner ribbing and staggered cylinders all increase strength and rigidity, decrease costly wear and failures.



FEATURE FOR FEATURE, DOLLAR FOR DOLLAR,



Built really rugged for extra life! Tests prove—double-wall cab construction, new rubber-bushed 3-point mountings, new extra-heavy reinforcements throughout give new GMC cabs amazing long life, make them ride safer, more comfortably.



Shorter turns and easier steering! New, wider track reduces turning circle as much as 15 feet and increases road stability. Improved recirculating ball steering gears cut steering effort.



More safe stops! Bigger lining areas, new Centrifuse brake drums extend brake life, make driving safer with surer stops.



NEW EXTENDED-LIFE V-6 ENGINES, AVAILABLE ONLY IN GMC TRUCKS!

Tough, accurate tests show new GMC V-6 engines—with proper maintenance and application—have a life potential of up to 200,000 miles without a major overhaul.

High output at low rpm gives you the torque to get loads moving and the horsepower to maintain top legal road speeds.



Positive acting, longer lasting valves!

Both intake and exhaust valves in the new V-6s are extra large and durable. You get big valve heads; large, short, stiff stems; positive rotators; integral valve guides . . . everything for the best sealing, less wear, freer breathing and cooler operation.

Five brackets solidly hold rocker shaft in exact location. Aluminum material expands to maintain correct valve-lash clearance at all operating temperatures.

Short, rigid push rods are practically deflection-free.

High-mounted camshaft has positive lubrication even at cold starts, to protect lobes and lifters from galling.

THERE'S A GMC V-6 ENGINE FOR EVERY JOB

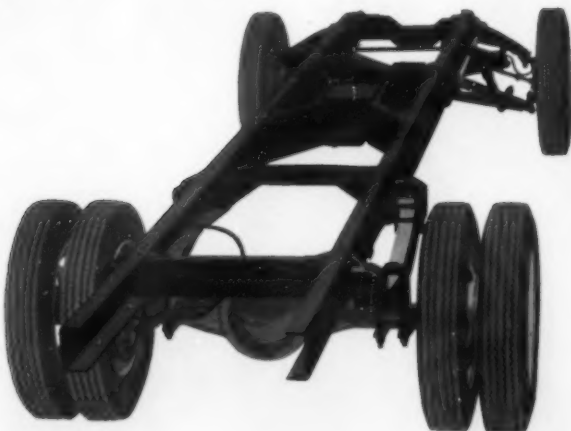
Model	Gross Torque Range	Max. Horsepower
305A	258-260 @ 1400-2200	150 @ 3600
305B	264-266 @ 1100-2000	150 @ 3600
305C	268-270 @ 1200-2100	165 @ 3800
351	308-312 @ 1400-2400	180 @ 3400
401	375-377 @ 1200-2000	205 @ 3200



New, easy servicing! Comparisons of factory-authorized flat-rate charges indicate that routine maintenance, even major overhauls on the V-6, take less time than on comparable-size competitive engines.



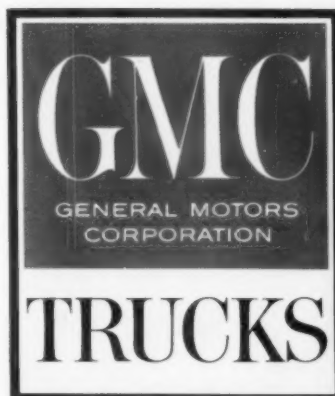
NEW GMCs ARE YOUR BEST TRUCK VALUE!



Softer ride . . . simpler handling! New GMCs with independent front suspension reduce wheel shimmy and tramp. Ball joints cut friction for easier steering. New maintenance-free torsion bars have variable rate to absorb shocks and jolts.

Stronger chassis! New design frames are up to 35% stronger . . . extra-tough to take the most severe construction hauling.

Longer spring life! New, standard 3-inch-wide vari-rate springs only support weight. Radius rod leaf transmits all torque and braking forces.



From ½-ton to 60-ton . . .
General Motors leads the way!

GMC Truck & Coach—a General Motors Division—Pontiac, Michigan.



Showing the Symons forms along with regular steel-ply panels in use for 492-ft. box extension under the new Seattle bypass of US 99.

Prefab Forms for Long Culvert Stretch-Out

In the Northwest, timber for forms is within walking distance on many jobs, but A. R. Anderson Construction Company, Seattle, found it profitable to use steel prefab forms for a large culvert lengthening job.

The problem: how to extend an existing culvert 492 ft. to allow Mercer Slough to pass under the new Seattle bypass of U.S. Highway 99. A culvert usually isn't a problem, but this one was since it involved working against time to get done before rains might flood the creek and bring a wash-out of their work.

The job was to extend the culvert on both sides of an existing road—345 ft. and 147 ft. respectively—to carry it under a new clover-leaf area. The creek had to be blocked off and temporarily rerouted.

Anderson's solution was to use new culvert form units developed by Symons, and team these with Williams Little Giant ties and Wil-

liams outer units to allow better tie spacing and more strength per tie.

The Andersons saved several days' delay by getting prefabs delivered immediately and ready to use. Symons engineers in Portland, aided by their Seattle man, Hal Caffee, designed a form lay-out so that the inside wall and fillet forms could be stripped out without disturbing the culvert roof shoring. This saved time and halved the amount of form material needed.

The culvert's dimensions: 10 ft. wide by 4 ft. high inside, with 6-in. fillets, top and bottom. Top slab thickness varied from 11 to 15 in., walls 12 to 14 in.

The state engineers had divided the culvert into four unequal sections for pouring—147, 65, 105, and 175 ft. Three working days were taken by an 8-man crew to erect forms and place concrete in the first or 157 ft. section. The next section, 65 ft. long, was erected, steel placed and wall concrete poured in one day. The walls had to set 24 hours

before pouring the top slab.

Other vital statistics: the job required about 700 cu. yd. of concrete and 140,000 lb. of reinforcing steel.

Walls totaling about 9,550 sq. ft. and top slab, 5,000 sq. ft. were concreted using 3,180 sq. ft. of Symons Steel Ply forms and 610 lin. ft. of Symons steel culvert forms. Inside forms were made up of a culvert form with a 6-in. haunch, with a 2' x 4' steel ply panel horizontal and a 6" x 4' steel ply filler panel horizontal, and a culvert form with a 6-in. haunch above that. The plywood deck was supported on 8" x 8" beams. Edge of the plywood was supported by steel ply filler angles attached to the culvert forms.

Ready mix from Lakeside Sand & Gravel Company was placed with quarter-yard buckets.

Earl Anderson, superintendent for the construction firm, estimates it took less than 200 man-hours to set up forms and place concrete, and about 60 man-hours to strip the forms.



Two examples of code numbers on Lowdermilk equipment, devised to help both field and office management.

Number System Helps Keep Tab on Equipment

A simplified system of identifying equipment has been adopted by a Denver contracting firm, H-E Lowdermilk Co. This company is a combine of Hoyle Lowdermilk, Inc., and Elbert Lowdermilk, Inc.

The system used is a modification of one proposed in 1956 by Jack Ward, a construction engineer. The Lowdermilks adopted Ward's number classification, such as "10" for the shovel group, "20" for the Caterpillar tractors, "21" for Allis-Chalmers tractors, "18" for International tractors, to mention a few of the major categories.

All major units which involve separate handling, repair and replacement are numbered in their respective classifications; the system for example also includes cable

control units ("26") and dozers ("22"). These two numbers are the first of the identifying series and are separated from the last digits by a dash.

The Lowdermilk firm has added additional digits, usually three, to cover any amount of equipment in each classification. The first two numbers in this series give the year of purchase, or in the case of used equipment, the date when it was new. The last digit serves two purposes. First, it identifies the owning corporation (odd numbers for Hoyle Lowdermilk, Inc., even for Elbert Lowdermilk, Inc.)

Second, it differentiates between identical pieces of equipment bought in the same year. As an illustration: if Hoyle Lowdermilk,

Inc., bought three new shovels in 1958, the numbers would be: 10-581, 10-583, and 10-585.

The same would apply if Elbert Lowdermilk, Inc., bought the new shovels, only with even numbers in the last digit: 10-582, 10-584 and 10-586.

R. J. De La Castro, secretary-treasurer of H-E Lowdermilk Co., credits the system with saving trouble in ordering parts for each unit. Leo Lang, mechanic on Lowdermilk's Interstate highway rock grading job west of Denver, Colorado (see *Roads and Streets*, October, 1959), said that the simplicity of the system made his maintenance and repair work faster and easier both in ordering parts and in accounting for expenses.

NEW! High Visibility Traffic Buttons

Work to Protect Life...

Even in the rain!

Cast from impact-resistant Thiokol polysulfide-base material. Easy to install. Stay put for years. Add highway safety... night and day, fair weather and foul.

New THIO-LINE Traffic Buttons, composed of high visibility reflector glass beads embedded in durable THIOKOL liquid polysulfide polymer base material, have a raised dimension—insuring effectiveness even in weather which blanks out conventional markers.

Easy to install—THIO-LINE buttons are bonded in place in 10-60 minutes (depending on the temperature) over asphalt, concrete or brick by THIO-LINE liquid polymer-base adhesive with a grip like steel.

Long-lived—in six years of testing on busy California thoroughfares, 25,000 buttons of the THIO-LINE type have averaged 99.9% durability record. Life expectancy of THIO-LINE: 10 to 15 years on city streets compared to 2 months for paint and 6 months for plastic markers. 25 years on the open highway contrasted to 12 months for paint and 2 to 3 years for plastic.

Thiokol

CHEMICAL CORPORATION

780 NORTH CLINTON AVENUE

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Registered trademark of the Thiokol Chemical Corporation for its liquid polymers, rocket propellants, plasticizers, and other chemical products

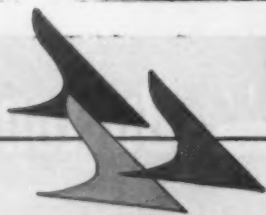
THIOKOL CHEMICAL CORPORATION, Dept. TM-55
780 N. Clinton Avenue, Trenton 7, New Jersey

Gentlemen: Please send me your technical bulletin describing characteristics and installation procedures on THIO-LINE TRAFFIC BUTTONS, and a list of distributors.

NAME _____ POSITION _____

FIRM _____ STREET _____

CITY _____ ZONE _____ STATE _____



Another example of

3 TYPES

9 MODELS

No matter what your job may be—from small grading work such as land improvement, plant sites or secondary road construction to the big million yard-and-over projects—there's a Euclid scraper of the size and type that matches the job. Each one is ruggedly built for long life in heavy service... job proved for big productive capacity... and is years-ahead in engineering design with easy service accessibility that cuts downtime.

EUCLID Division of General Motors
Cleveland 17, Ohio

Plants in Cleveland and Hudson, Ohio
and Lanarkshire, Scotland

➤ **SIX-WHEELERS**

12 yds. ➤

MODEL SS-12... 17 yds. heaped... 227 h.p.
... 5-speed transmission... 21.00 x 25 drive
and scraper tires, with 24.00 x 25 optional.

18 yds. ➤

MODEL SS-18... 25 yds. heaped... 320 or
336 h.p. ... Torqmatic Drive or 10-speed
standard transmission... 24.00 x 25 tires
standard, 29.5 x 25 optional.

24 yds. ➤

MODEL SS-24... 32 yds. heaped... 360 h.p.
... Torqmatic Drive with converter lock-up...
27.00 x 33 tires are standard with 33.5 x 33
optional.

33 yds. ➤

MODEL SS-33... 43 yds. heaped... 432 h.p.
... Torqmatic Drive with converter lock-up...
33.5 x 33 tires on drive and 37.5 x 33 on scraper
wheels.

Maximum stability for long, high-speed hauls...
scraper bowls are interchangeable with bottom-
dumps of 13, 17, and 30 cu. yd. struck capacities.



EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Euclid's Greater Dimension...

MOST MODERN AND COMPLETE LINE OF SCRAPERS IN THE INDUSTRY



ALL-WHEEL DRIVE "TWINS"

Twin-Power for big productive capacity and work-ability... a one-man earthmoving spread that can work more days and lengthen the working season.

14 yds. ➤

MODEL TS-14... 20 yds. heaped... two engines with a total of 296 h.p. ... separate Torqmatic Drive for each axle... 24.00 x 25 tires.

24 yds. ➤

MODEL TS-24... 32 yds. heaped... total of 563 h.p. ... separate Torqmatic Drives for each axle... tires are 27.00 x 33 standard with 33.5 x 33 optional.



OVERHUNG

Excellent maneuverability and ease of handling combined with power and speed that cuts cycle time.

7 yds. ➤

MODEL S-7... 9 yds. heaped... 148 h.p. ... with Torqmatic Drive... full 90° hydraulic steering... 18.00 x 25 tires standard, 21.00 x 25 optional.

12 yds. ➤

MODEL S-12... 17 yds. heaped... 227 h.p. ... 5-speed transmission... full 90° hydraulic steering... 24.00 x 25 tires.

21 yds. ➤

MODEL S-18... 30 yds. heaped... 336 h.p. ... with Torqmatic Drive and converter lock-up... 27.00 x 33 tires standard, 33.5 x 33 optional.

... for more details circle 311 on enclosed return postal card

Get all the facts and see how Euclid's Greater Dimension can bring a better return on your scraper investment.

HAZARD

"THE *THINKING* MAN'S CONTRACTOR.
THE *DRIVING* MAN'S FRIEND."



In the absense of something specific to excuse or explain, Hazard will liven up his road signs with something like the above.

Off-Beat Project Signs

Bruce Hazard, vice president of Hazard Construction Co., of San Diego, Calif., is taking the edge off the impatience of motorists who are slowed and inconvenienced by highway work being done by the Hazard firm.

Two years ago Bruce Hazard composed the first of a series of signs that have since characterized his highway operations in and around San Diego. Posted at either end of

a dusty, bumpy detour by-passing a Hazard spread on busy US 80, the first sign read, "Dig this crazy road! It'll be cool when Hazard is done."

"The reaction was remarkable," recalls Bruce Hazard. "We had phone calls and letters from motorists and newspaper publicity. It not only put a little humor into the operation, it did a fine public relations job for us as well."

Since then, other signs have ap-

peared on Hazard projects, all of them boldly lettered in black and red letters on a white background. One early sign read, "They say roads are paved with good intentions. This one is being paved by Hazard."

Asked if he runs into any difficulties with sign ordinances, Bruce Hazard replies that so far he has not. He adds that he is careful to keep his messages short and ties the drollery directly to the project.

(left): Used on a highway job near the Mexican border, this sign spoofs motorists with phrase made famous by Mexicans—manana (tomorrow) (right): Nothing eases a rough detour like a little humor, is this contractor's reasoning. Hazard Construction Co. of San Diego distracts bypassers with signs like this.

**YUP, HAZARD IS DOING
THIS PROJECT TOO
BE DONE MAÑANA**

**LOOK MA!! HOLES!
HAZARD
is filling them up**



SAVE MONEY
with the Galion
Model 503 Grader



Street Maintenance in MISSOURI



Road Maintenance in OHIO



Spreading Blacktop in WISCONSIN



Grading Housing Site in WASHINGTON



Grading Parking Area in TEXAS

The model 503 is economical in first cost, economical to operate, economical to maintain—and small enough to work efficiently in areas too confined for a large grader. Yet the 503 has sufficient weight and power—with "big grader" features and attachments—to do a wide variety of jobs with speed and profit.

The Galion 503 Motor Grader is available with a gasoline or diesel 58 hp engine. It has positive 4-wheel tandem drive and full hydraulic control. Extra large positive traction tires are same size front and rear.

Attachments for the model 503 include front-positioned hydraulic scarifier . . . booster power steering . . . hydraulic shiftable moldboard . . . leaning front wheels . . . hydraulic circle turn . . . stand-up height removable cab . . . snow plow . . . bulldozer . . . windrow eliminator . . . and creeper transmission (installed at the factory).



Backfilling Utility Line in COLORADO



Alley Maintenance in MAINE

You will invariably find owners and users (whether contractors or public officials) happy with the performance of the GALION 503 Motor Grader.

THE GALION IRON WORKS & MFG. CO.

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Dept. R-70, Galion, Ohio

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Firm or Dept. _____

Street _____ City _____ State _____

Grading Job Saved Despite Unforeseen Wet Clay

The term "unclassified excavation" can mean many things when applied to an earthmoving project in Vermont's mountain-bound Winooski Valley. It could have spelled chaos to S. V. Rossi Construction Company, Inc., of Torrington, Conn., one of 11 prime contractors working in the Valley on Interstate Highway 89 during 1959.

Rossi was the envy of virtually all the road builders working on the 11½-mile, \$16 million highway project when their job was let. His job was a perfectly laid out interchange section at Montpelier on which soil test bores showed typical Vermont slate and shale, gravel, sand, light clay and topsoil. All loaded hauls on this cut and fill job were down hill. Haul road grades averaged 2 percent. With a little bit of luck, the project would balance up without borrow. Contract price was \$1,276,000, with ample time for completion allowed by December, 1960 deadline.

The only new equipment purchased by the contractor for this job was a pair of Michigan Model 210, 24-yd. rear-dump tractor wagons. They were to be used primarily as rock haulers, replacing four smaller units in the equipment spread.

Excavation on Rossi's section totaled 520,000 cu. yd. of which 100,000 was rock. Cuts ranged up to 70 ft. in depth, with one rock cut of 65 ft. depth that contained 80,000 cu. yd. to be drilled, shot, loaded out, and delivered to the fill.

The weather was good. Work got into high gear early. Then the contractor encountered an unexpected pocket of oozing plastic blue clay, the kind that has swallowed up contractors.

A hurried conference called by the Rossi's determined the course to be followed. Stephen, father and general manager, presided. Contributing were the three brothers, Adolph, Reno, and Charles who is project superintendent on this job.

Quick studies indicated about 75,000 cu. yd. of this blue clay was to be moved to complete the 70-

ft.-deep cut called for in their contract.

Their plan was simple to state. They would use the blue clay on a fill section where "sandwich" type construction was permissible. A layer of rock would be covered with a layer of blue clay, which in turn would be covered with rock until the 32-in. fill lift was brought up to grade.

The subject of additional equipment was left open, pending accumulation of more operating experience with the digging and haul units they had on the job.

The technique chosen to load out the sticky blue clay employed a Caterpillar D9 crawler dozer to feed the Lorain 820 swing shovel. The shovel's tracks soon became almost entirely immersed in the clay which at times oozed out of the bank in sufficient quantity to require backtracking.

Hauling out of the clay cut was assigned to the new 262-hp Michigan wagons and three Autocar, 12-yd. 10-wheel rear-dumps. The remaining units in Rossi's truck fleet of a dozen rear dumps were found to be most valuable as rock haulers to the fill.

Rossi deployed the new tractor wagons to work where nothing else in the spread would. Equipped with abrasion resistant 29.5-25 rock tires on the dump unit, and 29.5-25 wide-base earthmoving tires on the tractor, the Model 210's waded into the clay hub deep to be loaded; then pulled themselves out for their half-mile-long run to the fill.

As an operating sidelight, it was pointed out by the contractor that his use of two types of tires on the tractor wagons had proved especially worthwhile. The rock tires on the haul unit stand up well in the dumping where the rigs are often backed into jagged rock to unload. The added traction and self-cleaning characteristics of the earthmoving tires on the tractor drive wheels make them desirable on the front end.

In an average 10-hour day, the pair of Model 210's were making 47 mile-long round trips each,



Rossi's equipment at work in big rock cut that led into unforeseen mess of oozing plastic blue clay (in background). Loading one of the 24-yd. Michigan 210 tractor wagons is a Northwest Model 6 shovel. A Bucyrus-Erie 22B dragline is cleaning up the bank above the clay area.



(Left): Dumping its 24-yd. mixed load of shot rock and dirt one of a pair of Michigan tractor wagons which—at this stage—teamed up to move 3,500 cu. yd. per day on a quarter-mile one-way haul. (Right): Charles Rossi, project superintendent for S. V. Rossi Construction Co., Inc., stands in cut carved through the oozing clay during visit with Howard W. Dashner of Interstate Equipment & Supplies Co., Inc., local Michigan distributor.

dumping between 1,500 and 2,000 cu. yd. of pay-dirt per day per wagon (loose measure) on the fill. Adding this production to that of the smaller Autocars, it was decided no extra equipment would be required.

When the emergency subsided, Rossi was quick to get the equipment spread back to normal operation. Their seasoned tractor wagons, incidentally, later worked on quarter-mile-long hauls of shot rock, each making 65 trips a day, and averaging 27 tons each per load.

How much did the "blue clay episode" cost? Project superintendent Charles Rossi answers this way: "We are still a good percent ahead" of original schedule.

AGC Produces Film on Road Program

The Associated General Contractors of America has completed the production of a 28½-minute, 16mm sound film of a panel discussion of "The Highway Program: Today and Tomorrow" by five leading authorities on highways. It deals with such topics as highway needs and benefits, construction costs, financing, and the current Congressional investigation of the program.

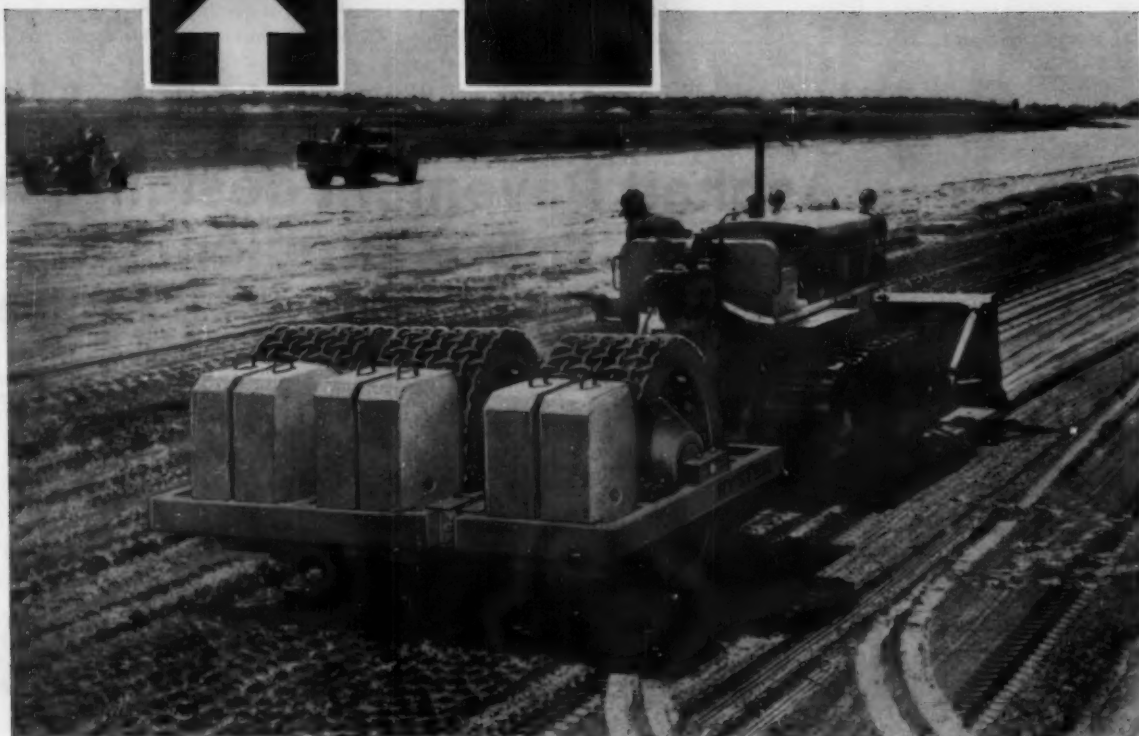
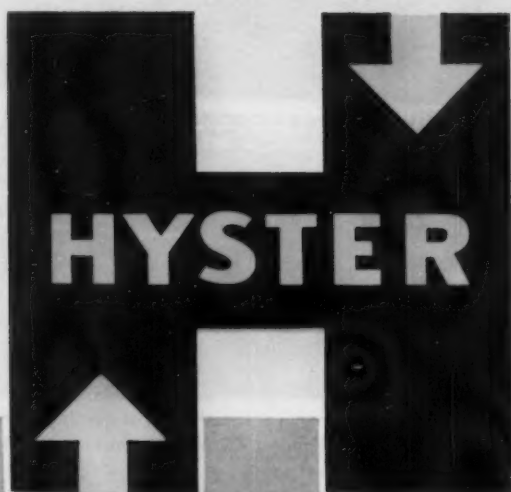
The panel discussion took place at the AGC's 1960 convention in San Francisco. The 90-minute

discussion was recorded on film, then reduced to a length suitable for use on programs of public meetings, civic club luncheons, and the like.

Participants are John A. Volpe, president of the AGC and former Federal Highway Administrator, moderator; Congressman Gordon H. Scherer of Ohio, ranking minority member of the House Subcommittee on Roads; Federal Highway Administrator Bertram D. Tallamy; A. E. Johnson, executive secretary of the American Association of State Highway Officials, and State Senator Randolph Collier of California.

The film is available for showings to civic or other public groups without charge through the Public Relations Department, Associated General Contractors of America, 1957 E Street, N. W., Washington 6, D. C., or through AGC chapters in various cities. Copies of the film may be purchased at \$75 each, or rented at \$10 a week.

AN ORIENTATION and information booklet, "The Road Ahead—Your Job With the Iowa State Highway Commission," was delivered recently to the Commission's 3,000 highway employees. Objective of the 24-page booklet is to acquaint employees with the organization, duties and responsibilities. The booklet emphasizes promoting a better understanding of the complexities in highway planning, construction and maintenance.



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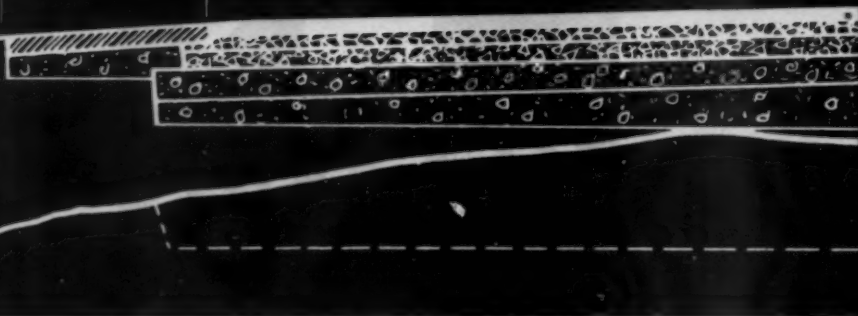
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ROADS AND STREETS, July, 1960



Map shows location of Interstate #81 in Watertown area.

ASPHALT-TREATED
SHOULDERS



Cross-section diagram shows composition of single 24-foot roadway on four-lane Interstate & Defense Highway #81. Note Asphalt-treated shoulders.

Look what they're doing with DEEP STRENGTH Asphalt Pavement in Upstate New York!

Advanced Asphalt Pavement design, over prepared subbase, solves problems in area where frost depth goes to 48 inches

Boulder-strewn glacial till near Watertown presented New York State Highway Department engineers with unusual problems. Here, winter temperatures often reach 20° to 25° below zero. The frost depth extends to 48 inches. In cuts, severe frost action sometimes forces boulders *through* the pavement with subsequent break-up and failure.

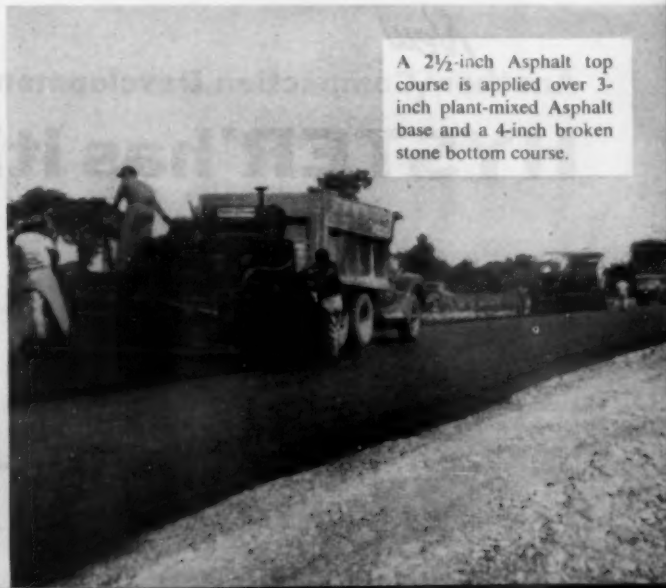
The cross-section and diagram on this page show how DEEP STRENGTH Asphalt pavement design solved the problems. Notice how the precepts of new DEEP STRENGTH Asphalt design are carried out. They in-

clude Asphalt base, Asphalt-treated shoulders, depressed median for good drainage and flat slope embankments for better safety. Capillary moisture action and frost damage are prevented by building the road structure with selected materials.

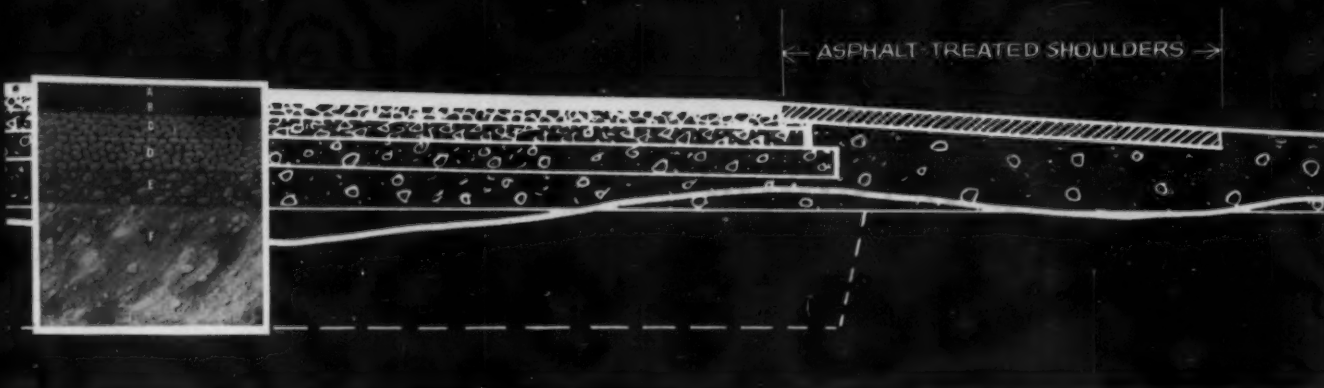
When designed like this—for DEEP STRENGTH—Asphalt pavements will carry the heaviest traffic loads without distress . . . with minimum maintenance cost. For example, the DEEP STRENGTH Asphalt-paved New Jersey Turnpike carried over 46 million vehicles during 1959.



In cuts, engineers excavated below frost level and prepared subbase using suitable locally available materials.

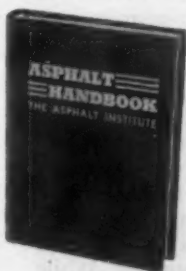


A 2½-inch Asphalt top course is applied over 3-inch plant-mixed Asphalt base and a 4-inch broken stone bottom course.



SAVE MONEY, TOO! Modern low-maintenance DEEP STRENGTH Asphalt pavements often cost *less* to build than Asphalt pavements designed to other standards. That's because the Advanced Design Criteria often permit Asphalt base to be substituted for some of the more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

NEW HANDBOOK . . . a new edition of the *Asphalt Handbook* incorporating all the Advanced Design Criteria implied by the term DEEP STRENGTH Asphalt Construction soon will be available at the Asphalt Institute office serving your area.



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 base course

C
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 of broken stone

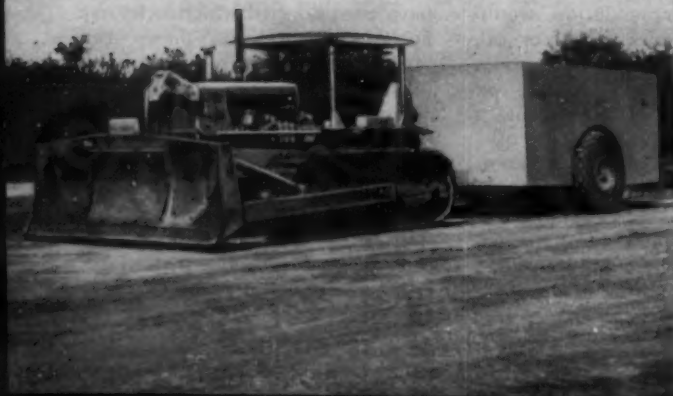
D
 6-inch graded
 gravel subbase

E
 6-inch bank-run gravel
 foundation course

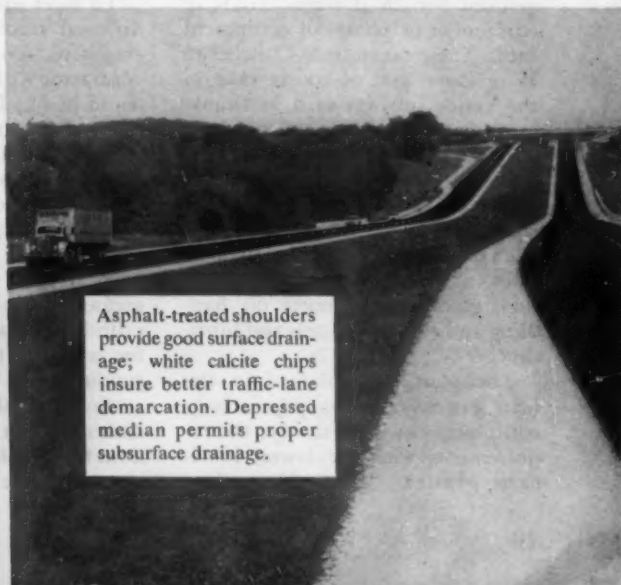
F
 Excavated to 48 inches
 below pavement grade in
 cuts—locally available
 backfill material
 compacted with
 "super" compactor.



50-ton rubber tire "super" compactor used on all supporting courses to assure smoother riding under all traffic weights to come.



Asphalt-treated shoulders provide good surface drainage; white calcite chips insure better traffic-lane demarcation. Depressed median permits proper subsurface drainage.



'Keep it Simple' Key to Equipment Lubrication Plan

Contractors these days are well aware of the importance of thorough preventive maintenance for their heavy construction equipment. The problem is one of follow-through. The mechanics and service men on the job are notorious haters of paper work. They want it kept simple.

These "facts of life" were kept in mind when Texaco's lubrication experts recently got together and issued a new "Simplified Plan for Construction Equipment." It consists of a manual with three sections. Based on the approach, "Keep it simple, but not too simple," Section I reminds company owners, superintendents, foremen, master mechanics and everybody, why lubrication of equipment—like everything else about the job—had best be done to a plan.

Part II then lists brief service suggestions for 38 different kinds of equipment or phases of equipment care. These range from Clutches to Wire Rope and of course take in the major subjects such as Crankcases, Engines, Torque Converters, etc.

Section III gives handy data on petroleum products including the classification grades of oils and greases, engine service classifications, and specifications for diesel fuel, gasoline and notes on handling and storage of fuels and lubricants.

The plan, as explained in the first section, is designed to help equipment owners satisfy all requirements with the fewest lubricant grades. "Experience has

shown," the booklet states, "that six basic types of lubricants will adequately serve the contractor." The simplified and consolidated plan is based on these six.

Why a Simplified Plan is Necessary. In order to serve industry in general, the oil companies have made available hundreds of types and grades of lubricants and thousands of different brands, notes Texaco. Of these, a construction equipment manufacturer based on his experience will specify certain types and grades for his equipment. Another manufacturer who has had a little different experience, will specify different lubricants. While the requirements of the individual lubrication charts can be readily followed when the equipment is used by itself, they pose definite problems when the equipment is used collectively.

To meet each manufacturer's individual recommendations, an oil company would have to supply a contractor with more products than could be handled practically in the field. For example, a survey of equipment on a small road job revealed that to meet each specific lubricant recommendation would require five grades of motor oil, four grades of gear oil, three grades of gear and cable lubricant, six greases, a track roll lubricant, a cylinder oil, and a hydraulic oil—for a grand total of 21 different products.

Obviously, the booklet states, it is desirable that these recommendations be consolidated and simplified where possible in order to eliminate

confusion, misapplication and waste, yet provide an adequate and economical lubrication program.

Another fact is of still greater importance to the contractor, the Texaco engineers feel: even when a reduction in the number of lubricants used has not been deliberately planned in advance, the personnel responsible and facilities available in the field limit the number of lubricants actually applied. Frequently, adverse circumstances such as bad weather or lack of time, leave the personnel no alternative but to decide on a consolidated group of lubricants to be used where many have been recommended. They must also decide where each should be applied.

Hence what is needed in the construction industry, Texaco people feel, is a simplified lubrication plan—one that has been carefully worked out in advance, so that improvised simplification methods in the field are no longer necessary. The new Texaco Plan is the result of this thinking.

The Simplified Plan is designed to fit the limitations of the portable service station. Six lubricant types have been selected which extensive field experience has shown can satisfactorily take care of nearly all construction equipment requirements. The basic Texaco Construction Equipment Lubricants are listed, with a brief description of each. They are listed according to the principal part or parts that each lubricant type is intended to lubricate. Engine oils, the first of six types, are represented by four rec-

ommended grades depending on the type of engine and severity of duty.

The other basic lubricant grades are those for gear boxes, hydraulic systems and compressors, ball and roller bearings, track rollers, and exposed gears and cable.

To serve as a guide in applying the six main Texaco Construction Equipment Lubricants, a Simplified Lubrication Chart has been prepared. The chart gives a more complete listing of lubrication points to which each of the six basic lubricants can be applied. It will be noted that appropriate viscosity or consistency grades of each lubricant have been shown for two operating temperature ranges. One is for 32 to 90° F air temperature which covers the majority of operations. The other is for 10 to 32° F covering most winter applications. For hotter or colder weather, other grades may serve better and the company experts are ready to advise.

This chart is supplemented by recommendations for special conditions, and for components not listed. There is known to be a "right" lubricant for such items as brake drum bearings on power shovels, rock drills and numerous other mechanical units.

Putting the Plan in Effect. To achieve optimum benefits from the Texaco Simplified Plan it is suggested that a contractor take the following steps when instituting this plan:

First, select the specific basic lubricants required by referring to Chart. Also, determine, with the supplier's help if necessary, if any special products are required for certain mechanisms; what quantity of lubricants are required so that adequate stocks are maintained; arrange for quick deliveries to the job; and check over grease guns and other application equipment.

Second, look into special instructions and exceptions to the general recommendations.

Third, provide the lubrication crew with copies of the Chart to use as a guide in applying the main lubricants selected.

Fourth, keep a monthly unit card on each machine and, see that (cumulative) total is filled out daily of the number of hours operated. This card can also be used to indi-

cate the amount of crankcase oil consumed and other pertinent information.

Following are a few excerpts from the booklet's Section II on "Service Suggestions."

Air Cleaners. Air cleaners may be of the wire gauze type in which the gauze is either replaced with a new element or washed in kerosene or diesel fuel, shaken to dry (do not blow with compressed air) and re-oiled. Use an SAE 40 or SAE 50 oil to coat the wire gauze.

The oil bath-type cleaner requires inspection varying from 5 to 50 hours to keep the oil at the proper level and the oil cup clean. Stick a screw driver down into the oil. If the sediment at the bottom is 1/4 to

1/2 inch deep it should be cleaned and refilled. Every 500 hours entire cleaner should be taken apart and cleaned.

Do not use crankcase drainings.

Carryover of oil into intake manifold indicates engine has been over-speeded, air cleaner is too small, oil is too light or too much oil added to oil cup of air cleaner.

For oil bath type air cleaners, Ursa Oil Heavy Duty of engine crankcase grade is generally recommended.

Don't remove oil cup when engine is running.

Centrifugal precleaners should be emptied when the glass container becomes half full.

Dry type (fluted paper element)

Continued on page 75

Texaco's Simplified Lubrication Chart For Construction Equipment

Part Requiring Lubrication	Interval, Hours	Texaco Products	
		90-32°F	32-10°F
Engines (Gasoline, LPG and Diesel)	100	Ursa Oil Heavy Duty or	Ursa Oil Heavy Duty or
Engine Accessories—Oil Lubricated	100	Ursa Oil Sup One or Ursa Oil Super Duty SAE 30	Ursa Oil Sup One or Ursa Oil Super Duty SAE 20-20W
Bearings—Oil Lubricated	As required		
Gear Boxes	1000	Universal Gear Lubricant EP 140 or Meropa Lubricant 6	Universal Gear Lubricant EP90 or Meropa Lubricant 3
Chain Drivers	100		
Flexible Couplings	1000		
Universal Joints	1000		
Other Oil lubricated parts in heavy duty services	10		
Hydraulic Mechanisms	1000	Regal Oil PC R&O or Alcaid Oil	Regal Oil A R&O or Cetus Oil
Air Compressors	200		
Electric Motors & Generators	1000		
Grease Fittings	10	Marfax Multi Purpose 2	
Plain Bearings	10		
Ball or Roller Bearings	100		
Wheel Bearings	1000		
Other Hand Packed Bearings	100		
Track Rollers	10	Track Roll Lubricant AC or Track Roll Lubricant Medium	Track Roll Lubricant Light
Exposed Gears	As required	Crater 2X or Crater 2X Fluid	Crater 1X
Wire Ropes & Cables	As required	Crater A	
Torque Converters and Hydraulic Couplings	Due to variations in equipment, see local Texaco Lubrication Engineer for recommendations.		

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"We like the mobility and versatility"

SAYS LOS ANGELES CONTRACTOR

Mr. C. J. Rounds, Jr. of C. J. Rounds Co. is speaking about their Model H-90 PAYLOADER tractor-shovel with Drott 4-in-1 Bucket that has served several months on this 1½-million-dollar contract with the Los Angeles Flood Control District.

It has performed a large variety of different work on this contract such as fine grading, bulldozing, backfilling, truck-loading, pulling piles and loading brush according to excavating foreman, Ray Brookins, who adds, "It's a fine machine." Operator R. J. Mann says, "I can do much more with the 4-in-1 bucket than with a regular skip."



"We like its durability"

SAYS NEW YORK CITY CONTRACTOR

"The H-90 PAYLOADER with 4-in-1 bucket is very efficient," says Robert V. Rusciano, general superintendent for the prime contractors, Rusciano Construction Corp. and Del Balso Construction Corp. on this 5½-million dollar section of Interstate Highway 87.

"We especially like it for close-quarter work, its durability for rough material handling, and the clean dumping action of the bucket. The H-90 has very good maneuverability giving fast operation with minimum hold-up of moving traffic that we often have to contend with."

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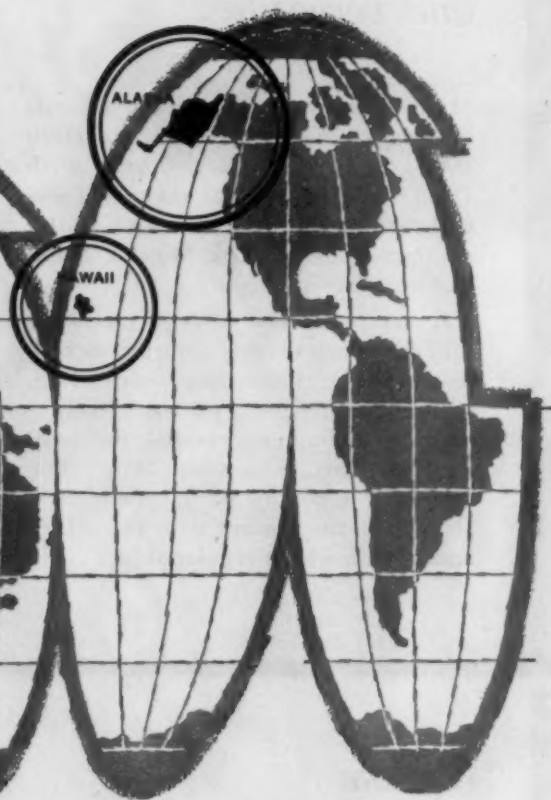
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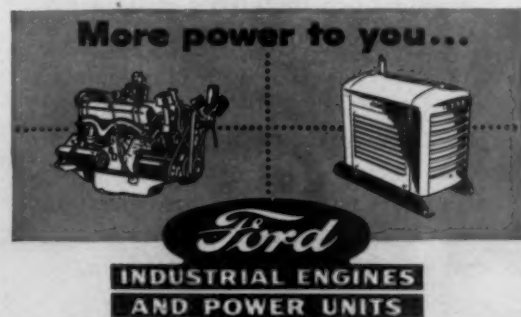
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EQUIPMENT LUBRICATION

Continued from page 71

air cleaners should simply be shaken or tapped lightly to remove dirt and dust and re-install. Do not clean with kerosene or diesel fuel.

Air Compressors. Keep air compressor valves clean to avoid excessive discharge temperatures.

Blow-down air receivers daily to remove any accumulated oil.

Service air cleaners every 5 to 10 hours, if necessary.

Use low carbon forming oil such as Texaco Regal Oil PC R&O or Alcaid Oil.

Engine Crankcases. The drain period recommended by the engine manufacturer covers normal operation. More frequent draining is necessary if oil temperatures are above normal, if engines are started and stopped often, or idled for long periods, if atmosphere is very dusty or if oil has been diluted to facilitate starting. Construction machinery operating conditions generally require draining engines at 50-hour intervals. If operating conditions are not too severe, 100-hour drains are practical. Oil draining or filter cleaning periods on the other hand should be shortened if filter or oil shows excessive contamination. Copper or white metal specks on the filter often serve as a warning of incipient bearing difficulties.

Drain oil while hot.

If oil filter is removed when draining oil, add an extra quantity when refilling crankcase.

Check oil level, every ten hours, after engine has been stopped for a few minutes to allow oil in upper part of engine to return to crankcase.

Crankcase ventilator air cleaners should be serviced when oil is drained.

When changing brands of oil, even when manufactured by the same supplier, it is advisable to drain the crankcase after the first 24 hours of operation to remove any previously formed deposits loosened by the new oil.

Lengthening the oil drain period is poor economy, since the additional wear and deposits due to greater oil contamination will cause greater maintenance and shorter equipment life.

Labor

AGC on Labor Reform

The Associated General Contractors of America has "spoken its thoughts" on the new labor reform legislation:

"The construction industry is vitally concerned with certain provisions for special treatment of construction that were considered by Congress in the labor reform legislation," said an AGC spokesman. Some of these provisions created a major controversy in the final deliberation.

Construction employers were especially aroused, notes AGC, by persistent efforts to insert in the compromise measure a provision contained in neither the House nor Senate bills which had been passed originally. This proposal, which was diametrically opposed to the labor reform goals of the legislation, would have torn away existing restrictions against secondary boycotts in construction, while at the same time proclaiming them illegal in other industries.

"The industry is grateful for the forthright rejection of this discriminatory proposal which would relegate construction contractors," notes this spokesman. Contractors by and large are small business men who would be given the status of second-class citizens. "We support the decision of the United States Supreme Court that there is no such thing as a 'good secondary boycott.'"

Another special construction provision, legalizing prehire agreements and a seven-day waiting period for a union shop, remains in the legislation. The AGC sought rejection of this provision in the Senate hearings on the Kennedy-Ervin bill, on the basis that it, too, would operate in the opposite direction from labor reform and would permit coercion of employers for top-down organization by unions, which has been considered an unfair labor practice.

As Senator John L. McClellan (D-Ark.) pointed out in opposing the prehire provision, it invites "dictatorship from the top," and "sweetheart contracts."

"We trust," said AGC, "that pos-

sible abuses of the prehire privilege will be watched carefully, and that diligence will be used in administering the act to minimize the possible harmful effects on the individual workman and on the thousands of smaller contractors throughout the country. Further, since some safeguards have been added, prudent negotiations by responsible employer groups can do much to prevent abuses inherent in this section."

Workmen's Compensation Law Analyzed

In some states an employer can go to jail for ignoring his state's workmen's compensation law. In many states he can be stopped from doing business. In most states he can be fined. The laws vary.

In Virginia, for example, most employers with seven or more employees must have workmen's compensation insurance. In Nevada most employers with two or more employees; in some states, most employers with one or more employees.

What's the law in your state?

To help employers learn how to conform to the workmen's compensation laws, the Chamber of Commerce of the United States published its 1960 biennial revision of *Analysis of Workmen's Compensation Laws*. The 57-page booklet includes the latest changes in U. S. state and federal Canadian provincial laws.

The booklet tells employers what they must report when employees are injured, it discusses their options in getting workmen's compensation insurance, and the maximum and minimum benefits paid for on-the-job injuries or disease to employees.

The booklet shows that in most states employers can hire handicapped workers, yet not be liable for the full incapacity if a hurt is aggravated. State funds pay for the incapacities not due to the additional injuries.

For a copy, send \$1 to Insurance Department, Chamber of Commerce of the United States, 1615 H St. N.W., Washington 6, D. C. Discounts for quantity orders.

Trailer-Mounted Paired Diesels Run This Crusher Show



Kee it portable, flexible, and simple yet able to meet varying production demands.

These were the primary goals set up with Curtis Construction Co., Spokane, Washington, planned its crushing plant. The job on the Rocky Reach Dam project called for a continuing supply of roadbed aggregates for rail and highway relocation at the site on the Columbia River near Wenatchee, Washington.

Subcontracting from Donald Drake and Goodfellow Bros., Curtis planned to tap a natural hillside deposit just above the river banks. Although the site is convenient to commercial power lines, company managers felt that they could better keep up with the varying needs of their plant by supplying their own power. Portable generators answered their needs. Two Caterpillar D353 diesel electric sets are full power source for the 4,000-ton-a-day operation since crushing began.

Arranged for utmost portability, the electric sets are mounted on a semi-trailer with their own 2,500-gal. fuel tank and load switching gear. Quick-connect cable junctions permit fast hookup when it is necessary to reposition the trailer. During the operation of the plant the two Cat units have satisfactorily supplied full power at a lower rate than the cost of tapping and stringing in lines from the nearby commercial power

lines. Normally one electric set is sufficient to power the operation. On days when demand is heavy, both sets are used.

Relocation of 25 miles of U.S. Highway 97 which runs through the area and 25 miles of Great Northern Railway mainline were primary parts of the contract. Curtis is furnishing railroad and highway ballast in 2½ in. minus size for the job. In addition, the Curtis plant produces highway top course sized ¾ in. minus, and asphalt batching aggregate in ¾ to ¼ in. minus.

The natural sedimentary gravel deposit is located just above the crusher on the relocation jobs. Ideally located for high-speed crushing, the deposit is fed by bulldozers. One Caterpillar D8 tractor with a straight blade, and a D9 with U-blade doze material into a feed hopper. From the hopper, an electric-powered conveyor belt carries the raw aggregate to a 24 x 36 Universal jaw crusher for primary crushing. From the primary, material is carried by conveyor to a double 4' x 14' Symons screening unit. From here it goes to a 4½' Symons cone and a 54" x 24" Pioneer roll crusher; then back through the screening unit where 2½" to 5¼" road aggregate is removed and directed by conveyor to a 24-yd. loading bin for transfer to 30-ton trailers pulled by Autocar tractor-trailer units.



Showing the natural sedimentary gravel deposits just above crusher site. Cat D8 and D9 dozers feed deposit to the hopper for high-speed crushing.

These two Cat D353 electric sets furnish all power for the crushing operation. One set can power the plant, but for maximum crushing, both sets are used. The off-side location permits engines to breathe clean air away from crusher dust and vibration.



TOP SCRAPER PRODUCTION

Continued from page 41

(1) The specified horsepowers are the maximum outputs of the respective engines, when new or in excellent condition, operating at sea level and at a temperature of 60 degrees F. The specified rimpulls given in Tables 1 and 2 are based on an engine having an output of 345 hp. If a tractor is operated at an elevation above sea level, the rated horsepower should be reduced 3 percent for each 1,000 ft. above sea level, unless a supercharger is used. It is customary to neglect this reduction for elevations not exceeding 1,000 ft. Since the amount of power consumed between the engine and the driving wheels of a tractor remains constant, regardless of the elevation, the rimpull of this wheel tractor will decrease at a rate of $(3 \times 345) \div 257 = 4$ percent for each 1,000 ft. above sea level. When an engine is operating at atmospheric temperatures below or above 60 degrees F, there will be a slight increase or decrease, respectively, in the power of the engine. For more information on this subject consult the book, "Construction Planning, Equipment, and Methods" by R. L. Peurifoy, published by McGraw-Hill Book Company.

Let us consider several plans for handling the earth on this project, involving modifications in the equipment and methods, to determine which will give the lowest cost. They are as follows:

Plan 1. Use the four-wheel tractors with standard gears and standard scrapers.

Plan 2. Use the four-wheel tractors with optional higher speed gears and standard scrapers.

Plan 3. Use the four-wheel tractors with standard gears and modified scrapers with increased capacities.

Plan 4. Improve the haul road to reduce rolling resistance, if necessary, to permit the use of tractors with higher speeds pulling scrapers with increased capacities.

PLAN 1. Use tractors with standard gears and standard scrapers. Assume that a scraper will haul an average load of 21.4 cu. yd., loose measure. The weights will be

	Pounds	Tons
Tractor and scraper only	58,800	29.4
Load, 21.4 cu. yd. x 2,420 lb.	51,800	25.9

Gross vehicle weight	110,600	55.3
----------------------	---------	------

The ratio of wheel horsepower per ton of gross vehicle weight is $264 \div 55.3 = 4.7$, which will permit satisfactory operation of the loaded hauling units.

The rimpulls required to move loaded and empty units, and the highest operating gears will be as follows:

	Rimpull, lb.	Gear
Hauling, 55.3 tons x 65 lb.	3,600	4th
Returning, 29.4 tons x 65 lb.	1,910	5th

Although it is possible to operate the hauling units at the maximum speeds specified in Table 1 for the given gears, such speeds are seldom attained for the full travel distances. For this reason the actual speed will be reduced to 90 percent of the maximum speed for a given gear.

A single crawler tractor will be used to assist in loading a scraper.

Table 1
Performance of Four-Wheel Tractor
Equipped with Standard Gears.

Gear	Speed, MPH	Rimpull, Lb. (1)	Horsepower at driving wheels
1st	3.2	31,330	267
2nd	6.1	16,175	263
3rd	10.0	9,890	263
4th	17.0	5,825	264
5th	27.9	3,545	264

Table 2
Performance of Four-Wheel Tractor
Equipped with Optional Gears

Gear	Speed, MPH	Rimpull, Lb. (1)	Horsepower at driving wheels
1st	4.1	24,445	267
2nd	7.8	12,675	263
3rd	12.9	7,700	264
4th	21.7	4,555	264
5th	35.8	2,765	264

The cycle time for a round trip should be about as follows:

	Minutes
Loading	0.8
Turning and dumping	1.3
Accelerating and decelerating	1.0
Hauling, 1 mile @ 0.9 x 17 mph	3.9
Returning, 1 mile @ 0.9 x 27.9 mph	2.4
Total time	9.4

Assuming a 50-minute hour, the production rate per scraper will be

Number of trips, $50 \div 9.4 = 5.3$
 Pal load per scraper, $21.4 \div 1.33 = 16.1$ cu. yd., bank measure
 Volume per hr., $5.3 \times 16.1 = 85.3$ cu. yd.

The number of scrapers required for an output of 620 cu. yd. per hour will be $620 \div 85.3 = 7.3$. Use 8 units.

The cost to own and operate a tractor and scraper unit, including the wages for the operator, will vary with the location, but a reasonable cost should be about \$18.00 per hour. For this rate the cost of hauling the earth will be $\$18.00 \div 85.3 = \0.211 per cu. yd.

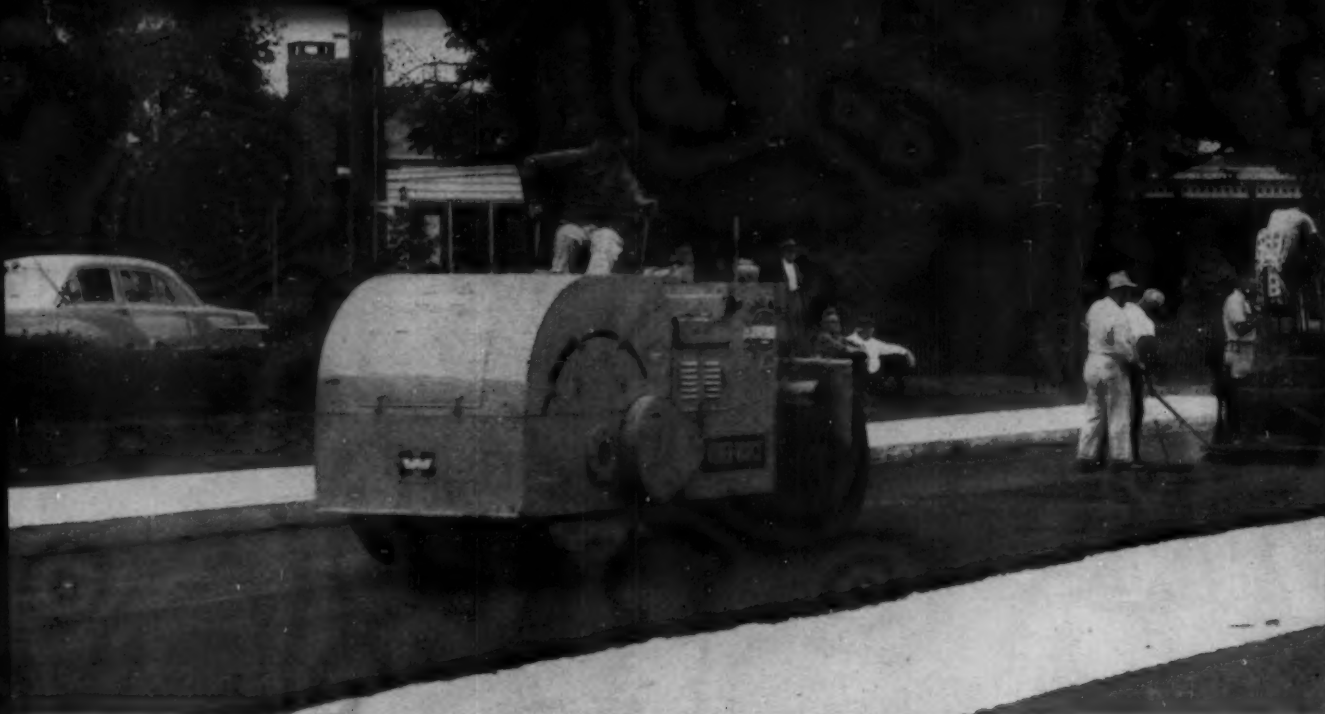
PLAN 2. Use tractors with optional higher speed gears and standard scrapers. Again, assume that a scraper will haul an average load of 21.4 cu. yd. The weights and required rimpulls will be the same as for Plan 1. The gears will be

Hauling, 4th
Returning, 5th

The cycle time for a round trip should be about as follows:

	Minutes
Loading	0.8
Turning and dumping	1.3
Accelerating and decelerating	1.1

Continued on page 82



HARRISBURG, PENNSYLVANIA—Aistate-Hanover Company paving crew at work on a city street in Hanover, Pennsylvania. The Huber-Warco 8-10 ton tandem roller along with several other Huber-Warco rollers handle most of their compaction work. The company has several asphalt plants and crews working at various locations in the state.



HUBER-WARCO *tandem rollers*

3-5 ton 4-6 ton retractable 5-8 ton 8-10 ton 8-12 ton 10-14 ton

DRIVE FEATURES — Water-cooled torque converter cushions against shock. Tailshaft governor maintains desired speed regardless of grade for easy, accurate control. Two-speed transmission* prevents loss of efficiency in tailshaft governor or hydraulic steering at all rolling speeds.

KING OF KINGPINS — Complete freedom from kingpin and swivel pin looseness. Tapered roller bearings permit "like-new" adjustment. No road scuff in reversing. Kingpin and housing easily removable.

CONTROL FEATURES — Variable hydraulic control adjusts to steering "feel" best for operator. Dual controls. Parking brake system completely independent.

PERFORMANCE PLUS — Work within less than 2 inches of buildings. Unsurpassed visibility. Final drive mounted in the frame, not on it, for longer shaft, gear and bearing life.

*Except for 3-5 ton and 4-6 ton models.

A trusted product name backed by respected distributor names from coast to coast



MOTOR GRADERS

Standard transmission models from 83 to 160 H.P. Torque converter and power shift transmission models from 102 to 195 H.P.



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3-5 Ton • 4-6 Ton
Retractable • 5-8
Ton • 8-10 Ton •
8-12 Ton • 10-14 Ton



3-WHEEL ROLLERS

10-Ton • 12-Ton •
14-Ton Standard Weight
10-12 Ton • 12-14 Ton
Variable Weight



MAINTAINER

M-52 — 45½ H.P.
Attachments are Lift-Loader,
Broom, Bulldozer,
Patch Roller, Scarifier,
Snow Plow, Berm Leveler

HUBER-WARCO COMPANY

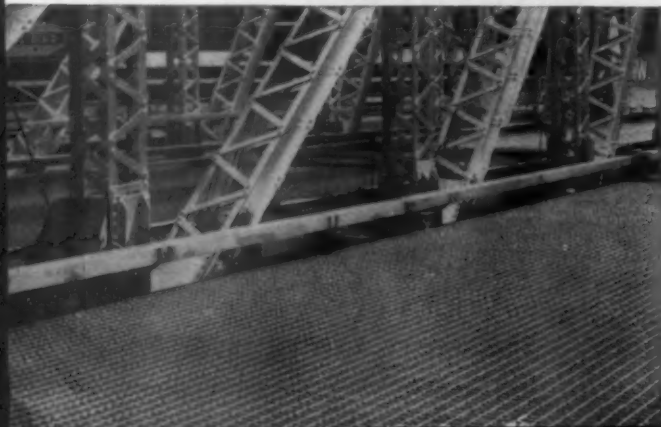
Marion, Ohio, U.S.A.

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USS AmBridge I-Beam-Lok is a sturdy, lightweight bridge flooring. It installs quickly and easily with few interruptions. The filled type is available in units 6' wide and up to 49' long that apply directly to stringers on spans from 6' up to 8' centers. The open type is also available for spans up to 4' long.

USS AmBridge Highway Beam Guardrail and Posts help safeguard traffic. This rugged, flexible steel beam guardrail is highly visible. It bolts easily but firmly to steel posts and is available in 25' lengths to minimize splicing.



This is a people pipe

This passenger underpass was fabricated from USS AmBridge Sectional Plate—normally used for drainage structures. It's buried 10-feet below the railroad tracks at the Philadelphia Electric Company's Eddystone Station near Philadelphia, Pennsylvania. □ USS AmBridge Sectional Plate was an ideal choice for this underground passageway, because it won't crack. Won't break. It's a permanent steel structure. It was easy to erect . . . there was no need for forms. AmBridge Sectional Plate comes in a complete range of sizes. And, it's fabricated to meet all federal and state specifications. Write or contact any one of our offices for literature and information on American Bridge Highway Products.

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ROADS AND STREETS, July, 1960

TOP SCRAPER PRODUCTION

Continued from page 78

Hauling, 1 mile @ 0.9 x 21.7 mph	3.1
Returning, 1 mile @ 0.9 x 35.8 mph	1.9

Total time 8.2

Assuming a 50-minute hour, the production rate per scraper will be

Number of trips, $50 \div 8.2 = 6.1$

Pay load, 16.1 cu. yd., bank measure

Volume per hr., $6.1 \times 16.1 = 98.3$ cu. yd.

The increase in the volume hauled per scraper compared to Plan 1 is $98.3 - 85.3 = 13.0$ cu. yd. per hr., or 15.3 percent.

The cost of hauling the earth will be $\$18.00 \div 98.3 = \0.183 per cu. yd.

The number of scrapers required for an output of 620 cu. yd. per hour will be $620 \div 98.3 = 6.3$. Use 7 units. If the delivered cost of a unit is \$56,000, Plan 2 will permit a reduction of this amount of money invested in construction equipment, when compared with Plan 1.

PLAN 3. Use tractors with standard gears, but add sideboards to the scrapers to increase their capacities.

Maximum capacity, $58,500 \div 2,420 = 24.2$ cu. yd., loose

Original load, 21.4 cu. yd.

Increase in capacity, 2.8 cu. yd.

The use of 12-in.-high sideboards will permit this increase in capacity. The additional weight should be about 450 lb., and the cost should not exceed \$200 per scraper.

The empty and loaded weights will be

	Pounds	Tons
Tractor and scraper only	59,250	29.6
Load	58,500	29.3

Gross vehicle weight 117,750 58.9

The required rimpulls and highest operating gears will be

	Rimpull, lb.	Gear
Hauling	3,820	4th
Returning	1,920	5th

Because of the increase in the load plus the increase in the depth of earth in the scraper, which will make loading more difficult, the time required to load a scraper will be increased to 1.0 minute.

The cycle time should be about as follows:

	Minutes
Loading	1.0
Turning and dumping	1.3
Accelerating and decelerating	1.1

Hauling, 1 mile @ 15.3 mph	3.9
Returning, 1 mile @ 25.1 mph	2.4

Total time 9.7

Number of trips per hr., $50 \div 9.7 = 5.15$

Pay load, $24.2 \div 1.33 = 18.25$ cu. yd.

Volume per hour, $5.15 \times 18.25 = 94.0$ cu. yd.

Hauling cost only, $\$18.00 \div 94.0 = \0.192 per cu. yd.

Number of scrapers required, 7 units

PLAN 4. Improve the condition of the haul road, if necessary, to reduce the rolling resistance and permit higher travel speeds. Consider scrapers with increased capacities from Plan 3, and tractors with higher speed gears from Table 2. If the rolling resistance of the haul road does not exceed 65 lb. per ton, a loaded unit can be operated in 4th gear, and an empty unit in 5th gear. Because of the decrease in the available rimpull at the higher speeds, the time required for accelerating and decelerating should be increased slightly above that allowed in Plan 3.

The cycle time should be about as follows:

	Minutes
Loading	1.0
Turning and dumping	1.3
Accelerating and decelerating	1.2
Hauling, 1 mile @ 19.5 mph	3.1
Returning, 1 mile @ 32.2 mph	1.9
Total time	8.5

Number of trips per hr., $50 \div 8.5 = 5.9$

Pay load, 18.25 cu. yd.

Volume per hr., $5.9 \times 18.25 = 107$ cu. yd.

Hauling cost only, $\$18.00 \div 107 = \0.168 per cu. yd.

Number of scrapers required, 6 units

Table 3 gives a summary of the information developed for each plan. An examination of this table shows that Plan 4 will permit the most economical handling of the earth, and at the same time it will require the lowest investment in hauling equipment.

The purpose of this article is to show how studies may be made, and to illustrate the monetary results which such studies may have on a project. Additional studies might reveal that there are other plans which will further reduce the cost of handling the earth.

While a level haul road was selected for these studies, hauling is frequently over roads which are not level. If a haul road is not level, the effect of grade must be considered in determining the rimpull required to move a unit over the road. For each one percent of adverse grade, increase the required rimpull 20 lb. for each ton of weight moving over the road. For each one percent of favorable grade, reduce the required rimpull by the same amount.

Table 3
Results of the Analysis of Each Plan Considered

Plan	Volume hauled per unit, cu. yd.	Hauling cost per cu. yd.	Number of units required	Cost of hauling units	Cost of hauling earth
1	85.3	\$0.211	8	\$448,000	\$633,000
2	98.3	0.183	7	392,000	549,000
3	94.0	0.192	7	395,400	576,000
4	107.0	0.168	6	337,200	504,000

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**Exclusive with Yuba-Southwest
Compaction Rollers: Independent
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You'll find a flexibility and much greater compaction uniformity over conventional single box type rollers in the patented design now available in Yuba-Southwest Multiple-Box Rollers.

The amazing amount of work these units will do has been thoroughly proved by tests under all earthfill conditions. Uniform compaction of heavy or soft lifts, regardless of rocks, is accomplished with fewer passes and with greater efficiency than by any other tamping method. A major design feature is in the individual weight boxes and wheels: each assembly is mounted independently for full vertical oscillation, providing a constant wheel load no matter what the terrain. Bridging or load shifting is eliminated, and the Yuba-Southwest Multiple-Box Roller rides smoothly with greatest possible stability.

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Why not get full information on this outstanding, money-saving equipment today. Choose from five models: 10 to 100 tons rated capacity. Adaptable to any job. Assembled in any combination of 3 to 6 boxes with flanged yoke.



Yuba-Southwest also manufactures
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*Sold and Serviced
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YUBA CONSOLIDATED INDUSTRIES, INC.



Main assignment for four Michigan Dozers on Utterback's 3,000,000 yd, \$5,000,000 highway contract: spreading up to 18,000 cu yds of scraper and truck fill per day.

Today: 4 Michigan Dozers for this major Midwest contractor. Tomorrow: 15

EACH REPLACES 2

At first glance, this *looks* like a typical big-job spread of equipment. Twenty tractors. Fifteen self-propelled scrapers. Sixty dump trucks. But then you look again. Four of the tractors are on rubber. All Michigans.

"And come back in a few years," says the contractor, Chelsea Utterback, Mt. Pleasant, Michigan, "and *almost all* our tractors on the grade will be rubber-tired Michigans!"

The reasons are pretty obvious. The Michigan units are *fast*—dozing and push-loading at speeds up to 6 mph, running job-to-job at speeds up to 28 mph. *They're economical*—on the basis of Utterback's experience, tires outlast tracks in sand "at least 6 to 1." *They*

help compaction. And Michigans come in a *range of sizes* to match the workload. Utterback Construction Company owns 162 and 262 hp units; 375 and 600 hp models are also available.

Speedy 262 hp unit also increases push-loading output

Utterback's 262 hp Model 280 often handles push-loading of 18-yd scrapers. Load time in typical sandy material averages 40 seconds. Load size averages 13 to 15 pay yds. "Overall scraper cycle time is further reduced," says Mr. Utterback, "by the Michigan's ability to quickly boost each pan out of the pit—and by its high-speed return. On cycles of 1000 to 2000 ft, we actually get an *extra load per scraper per hour!*"

Another major production advantage can be noted on the fill. Here, a Model 280 and two Model 180 Michigans spread 14,000 to 18,000 pay yards of sand and clay per day. Their dozing speed averages 7 to 12 mph. Moreover, compaction after the several passes necessary for normal dozing often reaches 98% (Proctor). "*On many jobs, each Michigan Tractor Dozer thus turns loose from fill assignment two crawlers and a roller,*" reports Mr. Utterback.

Job-to-job at 28 mph

On the contract shown—9 miles of four-lane bypass superhighway around Midland, Michigan—the Model 180 Tractor Dozers are being used alternately on two widely-separated fill sec-



Utterback's biggest Michigan Dozer, a 262 hp Model 280, often push-loads scrapers. Loading sand to 18 yd spill-point takes high-speed unit average of only 40 seconds.

CRAWLERS, 1 ROLLER

tions. Self-powered truck-like speed saves valuable time. The machines also backfill drainage structures and handle finish-grading.

"By working a 162 hp Model 180 *two hours* overtime on backfilling, we accomplish work *it would take a crawler*

all day to do," the contractor states.

Overtime replaces double-shifting

In addition to observing all the standard rules for construction equipment servicing, Chelsea Utterback has

a notable one of his own. Each machine is assigned an individual operator, and when double-shift operation ordinarily would be required, that operator stays with his machine for a limited number of overtime hours. Mr. Utterback is convinced by his production records that his system pays off.

He's equally convinced, from the same records, that so far as Dozers are concerned, dependable Michigans pay off "most of all."

Note how high operator rides above ground... out of the dust and with excellent view of blade. Despite its height, Dozer has very low center of gravity.



Michigan is a registered trademark of

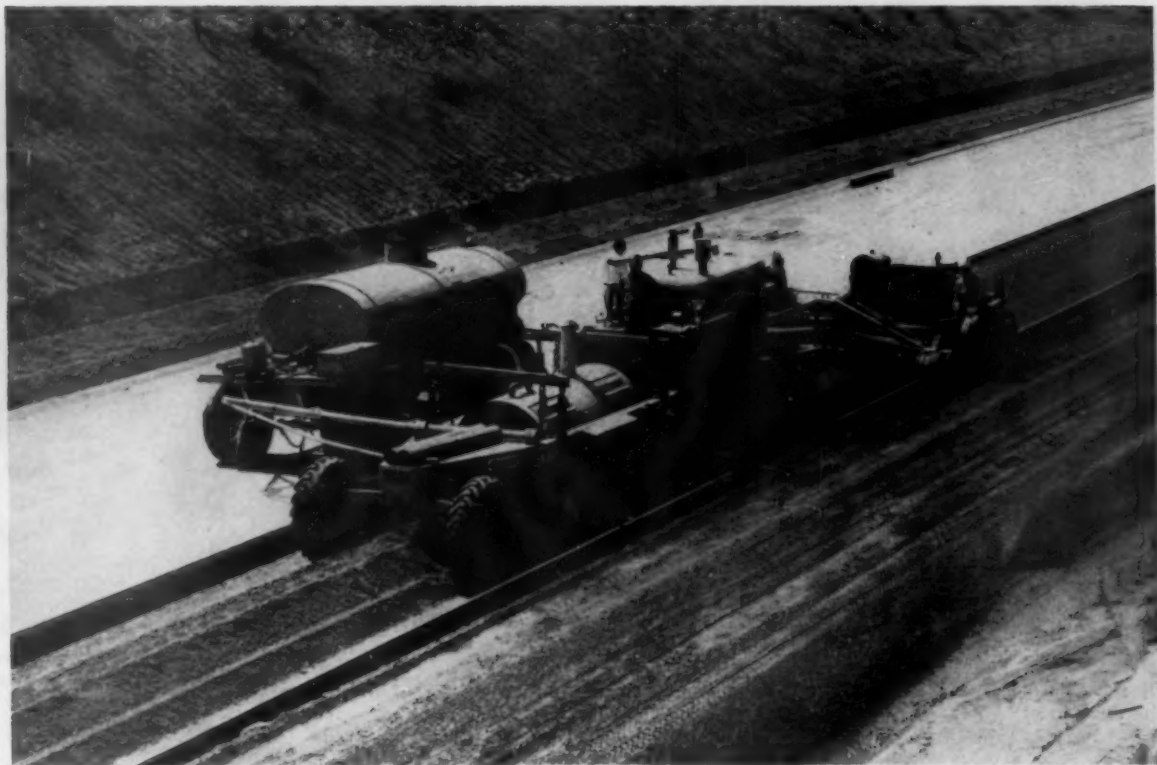
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Stationary plant quality... Traveling plant economy!



PETTIBONE WOOD STABILIZATION MIXER Mixes soil-cement at 550 tons per hour

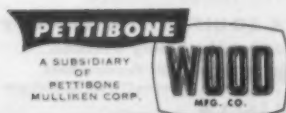
The PETTIBONE WOOD Model 54-S Self-Propelled Stabilization Mixer produces up to 550 tons of soil-cement stabilized base per hour—with stationary plant quality!

The 54-S is PETTIBONE WOOD's answer to bigger-capacity production for the accelerated highway program. More than a mile of soil-cement road, or several blocks of soil-cement streets often are built in ONE DAY using PETTIBONE WOOD equipment.

One-man operated, the 54-S picks up aggregates cleanly off the subgrade, mixes it with binders in a 54" pugmill

and lays it down in a uniformly mixed windrow ready for spreading. Electronic controls are available to maintain constant depth control.

Pettibone Wood stabilization equipment is used for highway, airport and parking lot construction the world over. Write today for free job studies and your copy of "The ABC's of Soil-Cement Stabilization", an informative, 36 page booklet on stabilization techniques.



... for more details circle 355 on enclosed return postal card

PETTIBONE WOOD MFG. CO.
P. O. BOX 620, NORTH HOLLYWOOD, CALIFORNIA
Originators of mix-in-place roadbuilding equipment

ROADS AND STREETS, July, 1960



On Yuma airbase: Noble one-stop batching plant setup with two 1,200 -barrel cement silos. Plant output, a 7.1-yd. truck (five 1.42 cu. yd. compartments) each minute.

TRIPLE PAVER

Continued from page 40

Sundt & Bevanda to provide dual-purpose wheels for use on either the forms or pavement.

A third dual-drum paver placed concrete for the top 4-in. course. Then came another Blaw-Knox spreader, two finishing machines, a vibratory joint machine, longitudinal float and form-riding mem-

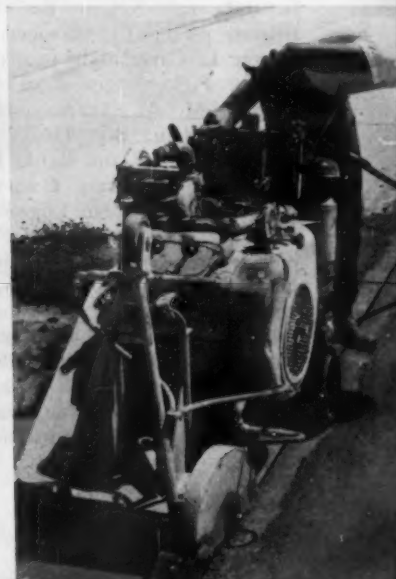
brane spray machine applying Hunt white membrane.

On those sections of the main runway where 11-in. unreinforced slab was called for, the Koehring Tribatch teamed with one of the two 34-E pavers, followed by the same rear spreading and finishing train.

Balancing supply equipment for the Tribatch on this run presented

no special problems. With all three pavers operating close together, it was easy to balance material arrival for the two lifts. While circuitous routing was often required to prevent compromising of activity on the older operational runway, the unobstructed areas adjacent to the spread itself provided nearly ideal conditions for the maneuvering of material and water trucks. The Tri-

(Left): Sundt & Bevanda's form-riding reinforcing steel cart, showing grooves cut in M-4 tank rollers. Rubber on either side of groove enables cart to ride adjacent slab without changing wheels. (Right): Cutting the $\frac{3}{4}$ "x3" deep transverse dummy joints.



batch delivered about 2 batches per minute, along with $1\frac{1}{4}$ batches per minute by each dual-drum pavers.

Expansion joints at 225 ft. spacing on runways and taxiways included asphalt impregnated fibreboard and special steel load transfer dowels, 2' x $1\frac{1}{4}$ ' diam. These were held in position before and during paving by dowel baskets running the width of the paving strip. Alternate dowel ends are tipped with metal sleeves permitting expansion and contraction without structurally weakening the joint. The dowels, sleeves and dowel baskets were specially built for the MCAAS job by Universal Form Clamp Co.

Transverse contraction joints, at 15 ft. intervals, include similar dowels and dowel baskets at every third contraction joint along the 13 in. thick sections of runways and taxiways. The dowel assemblies used on these joints differ from those used on the expansion joints in that the fibreboard and the dowel sleeves are eliminated.

Following an initial effort to hand work transverse joints, the contractor cut all transverse contraction joints as well as a longitudinal joint running down the center of each lane with ConCut saws, cutting $\frac{3}{8}$ in. wide and 3 to $3\frac{1}{4}$ in. deep joints. These were filled with Jet Seal two-component polysulfide joint filler manufactured by Allied Materials Corporation.

Running the job for Sundt & Bevanda were Nelson "Pat" Richardson, project manager, and George L. Cavanaugh, project engineer. Field engineer was Ed Sheeche; M. M. Yeary, concrete superintendent; Bob Husky, soil-cement foreman; and Banks Bourgeess, master mechanic. Captain J. A. McHenry, Civil Engineering Corps, U.S.N., the District Public Works Officer, 11th Naval District, San Diego, is Officer-in-Charge of construction. Design and construction are under the management control of the Bureau of Yards and Docks. Lt. Com. T. N. Cushman, Jr., C. E. C., U.S.N. is the Resident Officer-in-Charge of construction at MCAAS.

Job Safety

Equipment and Power Lines

How close can your equipment legally operate with respect to power lines? Following figures are given in the National Safety Council's Construction Bulletin; as supplied by Hunter P. Wharton, International Union of Operating Engineers.

No specific distance—29 states:

Alabama	New Hampshire
Colorado	New Mexico
Delaware	North Carolina
Georgia	Ohio
Illinois	Oklahoma
Indiana	South Carolina
Iowa	South Dakota
Kentucky	Texas
Louisiana	Vermont
Maryland	Virginia
Massachusetts	West Virginia
Michigan	Wyoming
Mississippi	
Missouri	

Arizona has no state regulation, but the Public Service Co. has a rule that no part of equipment shall come within 6 ft. of the line.

Maine has no specific distance, but rules require the assignment of a man to watch the clearance, and the use of manila guide lines, with no other contact except for operator.

New York has no specific distance, but general rule against operation where any part of machine or load may contact a power line. Six feet-10 inch states:

Arkansas	New Jersey
California	Pennsylvania
Florida	Rhode Island
Idaho	Tennessee
Kansas	Utah

Eight feet-2 inch states:

Nevada and Oregon.

Ten feet-seven states:

Alaska, Montana, Nebraska, North Dakota, Washington and District of Columbia. Connecticut has no law, but safety consultants on construction projects request that cranes and other equipment do not come within 10 ft.

Fifteen feet-one state: Minnesota
Variable: two states.

Hawaii: in transit, 6 ft., with signalman posted; otherwise 10 ft.

Wisconsin: varies with voltage with

the minimum 8 ft. vertical and 3 ft. lateral for 300 volts. More than 7,500 volts: 10 ft. vertical and lateral plus $\frac{1}{10}$ ft. for each 1,000 volts over 7,500.

Safety Leader Retires

Otto S. Holmskog, construction safety specialist of world renown, has retired from Employers Mutuals of Wausau, Wisconsin. During his 27 years with this firm his accident prevention counseling contributed to saving untold lives and millions of dollars for his firm's policyholders on projects. He was honored last year with special awards by the Associated General Contractors of America and the construction section of the National Safety Council.

Booklets by Mr. Holmskog on various phases of construction accident prevention are used throughout the world, and he pioneered in such now generally accepted techniques as "Toll Box" safety discussions, the use of dramatic safety demonstrations and in many other areas.

Concurrent with Mr. Holmskog's retirement, two safety specialists have been given new responsibilities with Employers Mutuals. Ralph L. Ward, Illinois branch office safety engineer, has moved to Wausau as construction safety specialist in the home office. J. F. Huntman, formerly field construction specialist at Albany, is also assigned to the home office staff but will be located in the Illinois branch office, River Forest.



Otto S. Holmskog

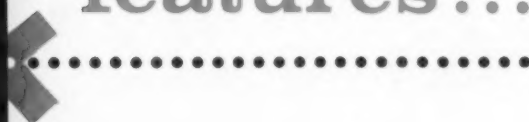
**It's
a fact...**

**ALLIS-CHALMERS
TRACTOR
LOADERS**

**give
you**

6

**big bonus
features...**





ONLY THE

TL

14

TL

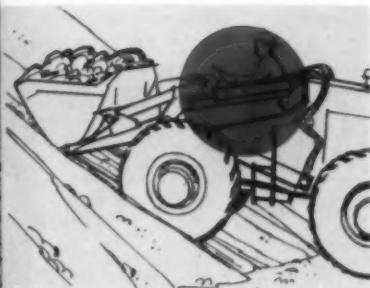
16

TL

20

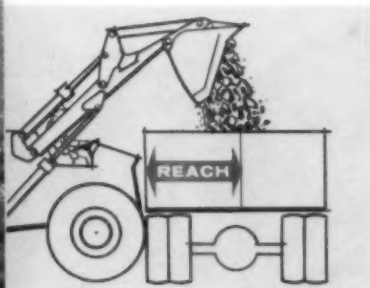
safe dump cylinder location

One "common sense" advantage that pays off is the safe dump cylinder location. The TL-14, 16 and 20 have cylinders located up and away from abrasives . . . out of grit that scores piston rods and damages hydraulic components. By mounting cylinders away from the bucket Allis-Chalmers loaders lift more pay load . . . less dead weight.



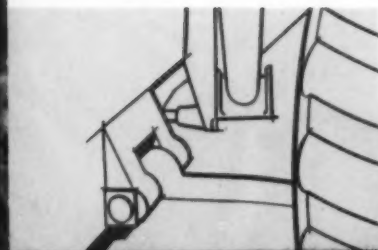
extra lift and reach

The "Big Three" give you more *usable dumping height and forward reach* than units of comparable size. Because Allis-Chalmers measures loader reach from tires, you are assured of *effective reach* . . . reach that pays off when loading high-body trucks. The TL-20, for example, gives you a foot or two of *extra reach* for faster loading with less chance of damage to truck or loader.



pin-connected axles

Axles on Allis-Chalmers "Big Three" loaders are pin-connected directly to the frame with 2-inch diameter steel pins . . . not automotive-type, U-bolt connections. In rough going, these units stay solid . . . axles do not roll or shift under load.



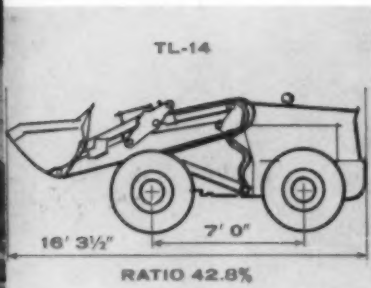
OFFER ALL OF THESE PR



LOVED ADVANTAGES

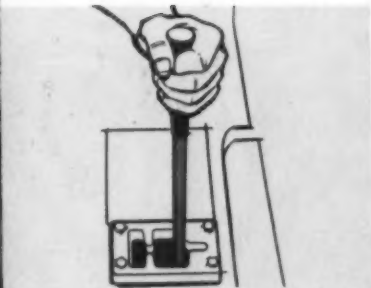
unmatched stability

All three models offer higher wheel-base to length ratio for added overall stability. The kind of stability that lets you carry big loads at higher speeds over rough terrain . . . without tipping or spilling the load. Operators work with confidence on tricky loading operations, slope and stockpile work.



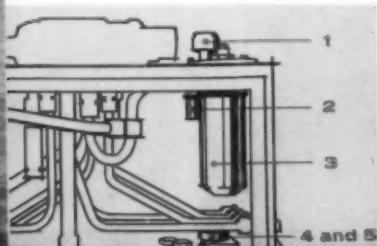
full control right in your fist

Exclusive single-lever control lets you go into and out of any speed, forward or reverse, with just a quick swish of your hand. Allis-Chalmers "one-stick" control makes fast work far easier by taking the time loss out of gear selection. Operators keep working at full capacity all day long.



5-way hydraulic filtering protection

Only Allis-Chalmers tractor loaders provide 5-way protection for the hydraulic system. Air is double filtered by: 1. air breather 2. air filter. Hydraulic oil is cleaned by: 3. full-flow micronic filter 4. conical screen, and 5. magnetic filter. Complete filtering protection means peak operating efficiency . . . extended life. Filters are easily accessible for cleaning and replacement.




YOU'LL "REALLY GO"



WITH THE "BIG THREE"

5,300-lb carry capacity... 1 to 3-cu-yd buckets

For all-out savings, the TL-14 with *Tractomatic* transmission is the machine for you. On short-haul loading or stockpiling your operator selects the best working gear. By flipping a lever on the steering column, he goes forward or reverse without shifting gears. *For all-out production* on long hauls or scattered jobs, the TL-14 with full-power shift transmission fits the bill. Operators move from any one speed to any other . . . forward or reverse . . . on the go.



14

7,000-lb carry capacity... 1½ to 4-cu-yd buckets

The TL-16 is big enough for real production work . . . yet compact enough for hit-and-run assignments. It features the same design, construction and operating advantages found in the bigger TL-20. This unit handles the same kind of work as the TL-20, but on smaller scale operations. On all jobs, you can count on the "16" for fast, efficient service day in, day out.



16

9,000-lb carry capacity... 2¼ to 5-cu-yd buckets

The 130-hp TL-20 is built for big, tough excavating and loading on construction, mining, quarrying or public works projects. Its many bonus features let you get more work done . . . easier. For example, the extra reach you get lets the TL-20 load big trucks faster and higher than other machines of comparable size.

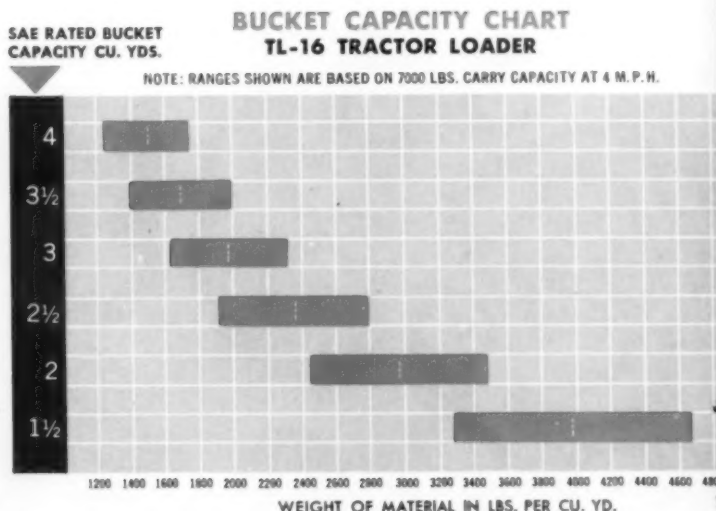


20

YOU choose the bucket best suited to your needs...

Allis-Chalmers offers 18 buckets for these 3 models. The TL-14, TL-16 and TL-20 all provide 6 different bucket choices. You pick the best bucket size according to the *carrying capacity of the loader*, the *weight of material you handle*, and the *working conditions in which you operate*. Your Allis-Chalmers dealer will help you select the best profit-making tractor-bucket combination.

This TL-16 bucket chart shows how bucket sizes can be determined:



Watch 'em work

Your Allis-Chalmers dealer will put a tractor loader through its paces on your job. Take a good look at all of the features that make these loaders the best buys on the market. Let him set up a demonstration now. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

move ahead with

ALLIS-CHALMERS

...power for a growing world



Inspecting rubber expansion joints at Lemoore Naval Air Station in California: Capt. V. C. Bertelsen (CEC), USN, resident officer in charge of construction; A. Kinnamon, project superintendent for the Griffith Company, contractor, and E. O. Bergholdt, Griffith project engineer.



Rubber 'Sandwiches' Tried in Prestressed Taxiway

Twenty-four rubber joints that contract and expand like bellows have been installed in a prestressed concrete taxiway at Lemoore (Calif.) Naval Air Station. The purpose is to give Navy aircraft a smooth-rolling pavement surface when the new master jet base is completed in 1961.

The rubber "sandwiches," developed by B. F. Goodrich Industrial Products Company, have been used previously in highway construction but this is the first installation for aircraft.

Extending 75 ft. across each end

of a 500-ft. segment of prestressed concrete taxiway, joints can absorb up to 3 in. of slab movement due to temperature changes. The rubber joints reportedly stay level with the concrete surface under all temperatures.

The joints are each 13 in. wide. They are made in 6-ft. and 6½-ft. lengths for installation in multiples to span the concrete sections in highways and airstrips that are conventionally 24 or 25 ft. wide.

Steel trusswork on each side of the ribbed rubber surface anchors the joints into the concrete to form

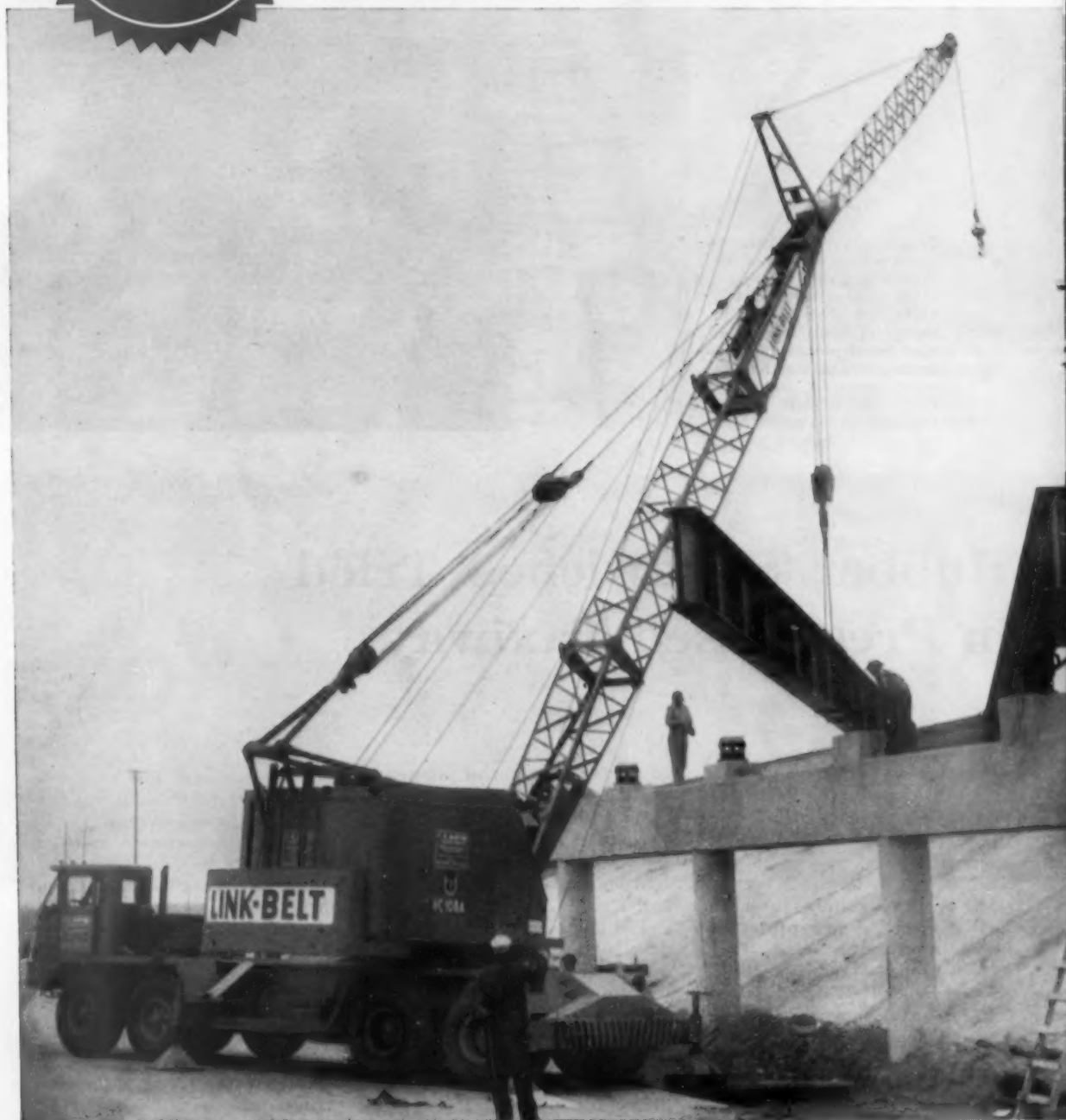
a water-tight seal. The joints meeting Navy specification were installed by Griffith Company, of Los Angeles, the contractor, under the U. S. Navy Bureau of Yards and Docks, as part of increments of airfield runways, taxiways and parking aprons, calling for \$15,770,000 of construction. The prestressed concrete taxiway segment is an experimental installation.

Use of the rubber expansion joints is expected to keep the taxiway free from weather damage and greatly reduce repair and maintenance costs.

For the security of men and machines a LINK-BELT SPEEDER is



safety rated



from base to boom

Any accident can be serious . . . oftentimes triggering a costly chain reaction affecting income, equipment, spoilage, schedules, overhead and job profits!

Construction currently ranks as the fifth most hazardous industry. And that's why Link-Belt Speeder engineering gives a top-priority rating to safety in a conscientious effort to eliminate the mechanical causes of accidents . . . to widen the margin of protection for both men and machines.

Today's contractor shows a growing regard for the safety factor in the purchase of new equipment. He knows that "programmed safety" can mean lower insurance rates and premium rebates, often accounting for extra thousands of dollars a year . . . enough to affect the success of his bidding practices.

Many of these same contractors are already enjoying the maximum security offered in the following list of "Safety-Rated" features. See your distributor for more details or write LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa.

107-60N



Link-Belt Speeder features . . .

for that extra-wide margin of protection for men and machines on the move!

- **SPEED-O-MATIC, THE TRUE POWER-HYDRAULIC CONTROL**, keeps operators alert all day by sharply reducing the fatigue factor.
- **POWER LOAD LOWERING (reversing) CLUTCHES** for either or both operating drums. Independently operated for safe load lowering.
- **INDEPENDENT POWER RAISING OF BOOM** with controlled lowering against engine compression (or, for extra precision, a lowering clutch for power down).
- **POWER-HYDRAULIC SWING BRAKE** holds machine at any radial position . . . easily set for slight drag where needed.
- **POWER-HYDRAULIC STEERING** with foolproof travel mechanism . . . no chance for "free wheeling."
- **ELEVATED OPERATOR'S CAB** for all-around visibility . . . ups production and safety.
- **ELECTRIC REMOTE CONTROL** for truck-cranes. Operator positions machine on the job without leaving his seat.
- **HYDRAULICALLY CONTROLLED OUTRIGGER JACKS** and beams eliminate manual setting . . . encourage operators not to take unnecessary chances on marginal lifts.
- **OUTRIGGER PONTONS** are light-weight to assure frequent use . . . can't slip off jack.
- **YEARS-AHEAD "HI-LITE" CRANE BOOM** virtually ends hazardous whip or sway in long boom operations.
- **BOOMHOIST LEVER KICKOUT DEVICE** makes it impossible to boom beyond the danger point during close-radius operations.
- **DRUM ROTATION INDICATOR** tells operator how far load is being raised or lowered during "blind" loading or erection operations.
- **BOOM ANGLE INDICATOR** for safety double-check.

LINK-BELT SPEEDER



21 crawlers



6 truck-cranes

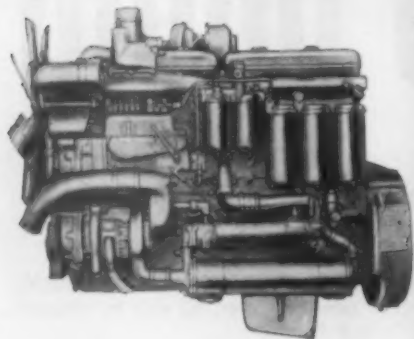


4 self propelled

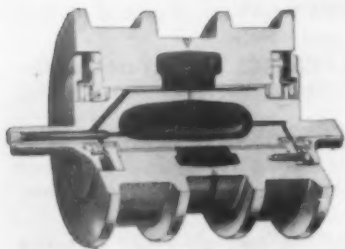
It's time to compare . . . with Link-Belt Speeder

. . . for more details circle 329 on enclosed return postal card

Three new International TD-25's of contractor V. E. Posey's fleet team up preparing home sites from a mountainside...near San Diego, California. One "25" operator comments: "The power is there, but big engine 'sound and fury' are just about gone!"



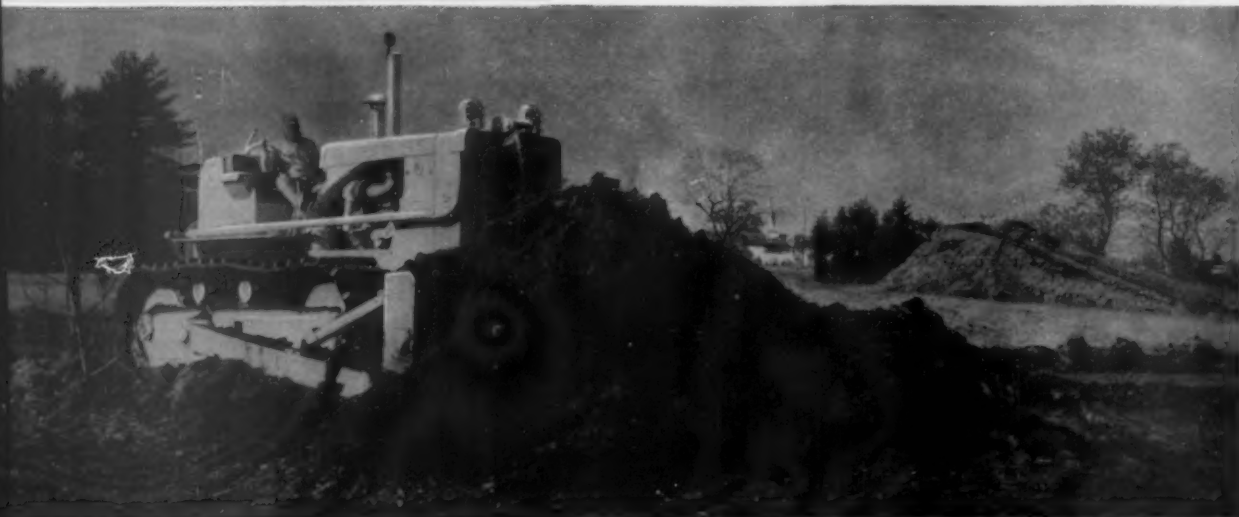
Big power "plus" of the new TD-25 is the new direct-start, 6-cylinder turbocharged International DT-817 diesel engine. Tri-metal crankshaft bearings; valve rotators; dry-type air cleaner; externally-mounted, gear-driven oil and water pumps—all are typical DT-817 long-life, high-output features!



How you get full-

Thick-shelled International Dura-Rollers have king-sized lube reservoirs, positive sealing, and exclusive relief-passage protection from over-lubrication. These minimum maintenance track rollers give you practical 1,000-hour lubrication intervals!

Keep full loads on the move full time with exclusive Planet Power-steering. Full power on both tracks, full time, is the answer! And Hi-Lo on-the-go power-shifting lets you match power to condition, instantly, to keep loads "on the move"—and increase speed where practical! This "25" belongs to Berke Moore Co., Inc., Boston expressway contractor!





load turns...full-speed cycles with proved TD-25 standard equipment!

As standard equipment at no extra cost, the new 230-hp TD-25 gives you the International® proved control combination that has been outproducing king-sized clutch-steered crawlers for years!

You get combined Planet Power-steering and Hi-Lo on-the-go, power-shifting exclusively in the new International TD-25. And you get this basic, built-in design advantage in your choice of torque-converter or synchromesh model!

With this and all its other big advantages, the TD-25 can outearn other big rigs up to 50%—on push-loading, bulldozing, or pulling big drawbar tools such as a shale-shattering ripper!

No "dead-track drag" or "gear-shift lag"!

Planet Power-steering gives you full-time "live" power and traction on both tracks, to make full-load turns—and to eliminate load-limiting "dead-track drag." And Hi-Lo on-the-go power-shifting instantly matches power to conditions to end load-losing "gear-shift lag."

Hi-Lo power-shifting makes the TD-25 the industry's only king-sized 4-speed torque-converter crawler, and the only one with load-matching efficiency-range control. In the synchromesh transmission "25," the Hi-Lo planetary system gives eight speeds forward and

reverse. Either model gives you cycle-speeding, up-or-down, on-the-go power-shifting with "finger-tip" ease!

Power-shift and power-steer the new "25" with king-size loads—around curves, upgrade, anywhere. Prove what it means to command full-time, full-load ability to outearn clutch-steered king-sized crawlers, up to 50%—and with standard control equipment! Compare simplified TD-25 design—the only planetary system engineered and located to give you "live track" power steering and on-the-go, up-or-down power shifting! See your International Construction Equipment Distributor for a demonstration!



***International
Construction
Equipment***

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

... for more details circle 320 on enclosed return postal card

Table 1
Dozer Performance with Power Shift

Doze Distance (feet)	50		100		150	
	Direct Drive	Power Shift	Direct Drive	Power Shift	Direct Drive	Power Shift
Cut .....	.33	.35	.40	.37	.35	.35
Doze .....	.37	.31	.64	.45	.92	.66
Shift (F to R) .....	.04	.01	.04	.01	.07	.01
Reverse .....	.24	.27	.33	.32	.39	.42
Shift (R to F) .....	.09	.01	.08	.02	.11	.02
Total cycle time (avg.)	1.07	.95	1.49	1.17	1.84	1.46
Cycle time (17 passes)	18.20	15.80	25.43	20.43	30.79	25.25
Material moved (bcy)	81.9	84.5	72.0	68.7	74.25	77.6
Production (60 min. hr.) (Assuming 100% efficiency for both men and machines)						
Production increase	270	319	170	202	145	185
Power shift over direct drive						

Power Shift Transmission Boosts Dozer Production

Power shift transmission offers a way to boost production on any one of several bulldozer applications, according to a bulletin from T. J. Zarse, Market Division, Caterpillar Tractor Co.

Figures obtained in an accurately controlled test indicate that this firm's recently-introduced power shift transmission offers a dozing production advantage of up to 27 percent over that possible with direct drive tractors equipped with a constant mesh transmission.

Two new 235-hp tractors, one with direct drive and the other with a power shift transmission, were used in the test, covering distances of 50, 100 and 150 ft. Each tractor was run through 17 complete cycles under stop watch.

Working gears used by the tractor in all phases of the test were: Direct drive—cut and doze, second; reverse, sixth; Power-shift—cut, low; doze, second; reverse, third. The production and cost figures obtained in the test are shown in the accompanying table 1.

Figures used in obtaining hourly owning and operating costs are also

Table 2
Basis for Comparing Hourly Costs in Tests

	Direct Drive	Power Shift
Total Cost*	\$40,000	\$43,135
Depreciation period (5 years)	10,000 hours	10,000 hours
Depreciation per hour	\$4.01	\$4.31
Interest, insurance, taxes	1.20	1.29
Fuel, lubrication, grease	1.33	1.33
Repairs (90% of depreciation)	3.61	3.87
Operators wages	3.00	3.00
Total	\$13.50	\$13.80

*Includes FOB factory cost of tractor, straight bulldozer, cable control, hydraulic till cylinder hydraulic control.

Table 3
Production Compared, allowing for Less Fatigue

Doze Distance (feet)	50		100		150	
	Direct Drive	Power Shift	Direct Drive	Power Shift	Direct Drive	Power Shift
235 Horsepower Tractor						
Production per						
55 min. hour (bcy) .....	...	292	...	185	...	170
50 min. hour (bcy)	225	...	142	...	121	...
Production Increase						
Power shift over						
dir. drive		29.8%		30.3%		40.5%
Cost per yard (cents)	5.85	4.73	9.26	7.46	10.87	8.12
Cost advantage		19.2%		19.4%		25.3%
Power shift over dir. drive						

shown herewith.

An examination of the production table will show that in the 17 passes each machine moved approximately the same amount of dirt, with a slight advantage going to the power shift machine. The power shift tractor moved an average of 4.52 cu. yd. per trip, the direct drive tractor 4.49 cu. yd. The chief advantage was that of greater speed and production; the power shift saved time by practically eliminating shifting time and by reducing the doze time. The ease of shifting allowed the operator to upshift when the blade was full and carry the material to the fill in a higher gear. In order to do this on the direct drive machine, it would have been necessary to stop, shift, and start again. This would have lost more time than if the whole distance had been dozed in the cutting gear.

Considering that the shift cycle could be repeated as often as 400 times in a 10-hour day, it is easy to see that at the end of the day the operator of a powershift machine will be considerably less fatigued than the man on a direct drive tractor. The fatigue factor is usually expressed in terms of operator efficiency. For this reason it is customary to estimate the efficiency of a direct drive machine at 50 minutes per hour. Taking into account the considerably smaller amount of effort required with the power shift transmission, there is reason to believe that in the future the efficiency of machines equipped with this transmission option will be estimated at 55 minutes per hour. If these figures are used, the production advantage of the power shift over the direct drive would be as shown in table 3.

Pennsylvania Would Borrow for "I" Roads

A recent bill in the Pennsylvania legislature would empower the State Highway and Bridge Authority to borrow up to \$500 million to speed construction of interstate highways.

Senator Z. H. Confair, president of the Keystone Shortway Association, urged this financing to step up the project Keystone Shortway, the Anthracite Expressway, the Erie-Pittsburgh Freeway and the Delaware Expressway.

BIG

in QUALITY and ECONOMY



OWEN

OWEN clamshells are constructed with increased power and more durability foremost in mind. One of these features is the recessing of the top of each lip to receive the bowl plates. This gives the bucket a smooth interior and also relieves all stress and shear on the rivets that join the lips to the bowl plates. **Recessed lips are standard on all OWEN buckets—and at no additional cost!**

This is just one of the many reasons why OWEN Buckets are guaranteed pound for pound—size for size—to get a bigger load each bite—a larger output each day.

Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.



The OWEN BUCKET Co.

BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

MODEL HELPS PLAN JOB

Continued from page 43

the men became familiar with the relation of all these ramps and structures to each other."

The "L" shaped interchange represented by the model is 2.4 miles long and has 32 bridges and 20 retaining walls. It centers around the completed Santa Ana Freeway, which carries as many as 15,000 vehicles an hour into and out of downtown Los Angeles.

"It is impossible for project supervisors to grasp the relation of one part of the project to the overall picture. This is done by looking at the plans and profiles of this job," remarks Barnes. "There are too many different elevations, too many roads going over and under to work the job blind. We clear up this confusion by studying the model in conjunction with the drawings."

Haul routes on the job take on the character of a Coney Island roller coaster, as scrapers and other construction equipment pursue twisting routes to keep them off the busy freeway, the new structures and the jammed access roads cutting through the heart of the project. Off-road hauling permits heavier payloads and steadies hauling, once the routes open up as a result of the firm's planned sequence of job operations.

"One picture is worth a thousand words," noted superintendent Barnes, "and a model is even better than that. Haul routes are not designed into the job—we have to arrange them ourselves to suit overall job specifications. We can look at the model and plan from there what we'll do, how we'll do it."

These are all "extra" benefits from the model, which was originally built to aid in road and structure design and to have subordinate value as a public relations exhibit for the Highway Division. When the project is complete, consideration is now being given

to using the model for orientation of drivers, who will unquestionably experience their own brand of confusion when the huge complex is opened for use.

Computer Speeds Up Montana Work

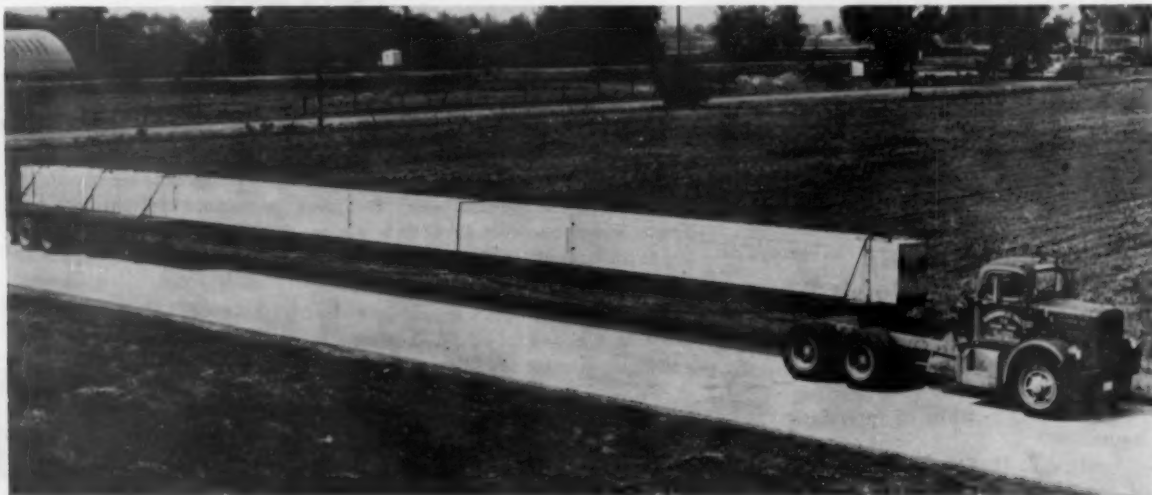
The transformation that has come about with the installation of the IBM 650 Data Computer in the Montana Highway Commission office, was told recently in a bulletin to the Commission's employees. Since the machine was installed late in 1959, the 14-staff members of the IBM Section have been programming an increasing volume of work for the electronic computer.

The machine is used to calculate payrolls; has helped the accounting division inaugurate a more efficient inventory system; has checked contractor bids for errors; summarizes average bid price; given great results on traffic statistic analyses; calculated the Road Deficiency Report; and is helping on estimates for the economic analyses of route studies.

Where the machine is really paying off, according to this statement, is in the department's earthwork calculations in the construction division.

"This certainly beats the old method of dogging each cross-section," notes the commission bulletin. In April 1960, the machine worked 175 hours and in that time handled earthwork quantities on 217 miles of highway.

A typical day's work for the computer is cited as taking in a 2.4-mile section of highway involving 126.2 stations and 204 cross-sections. Keypunch time was five hours, and the electronic machine was busy only 30 minutes, or at the rate of five miles per hour. Total direct costs were: keypunch rental, \$2; labor, \$9; IBM 650 rental, \$15; 407 Printer, \$2; operator, \$2.50. Total, \$30.50.



Hauling the Long Ones

Prestressed concrete beams—eighteen of them weighing 43 tons each—were hauled by this trailer hookup to a bridge site between Toledo and Detroit. Auburndale Truck Company of Toledo towed the 105-foot-long beams with a White 9064T tractor equipped with 36-in. tandem axle, 215-hp White 490 gas engine, and 5-speed transmission with 3-speed auxiliary, making the 18 trips handily without mishap.

"WE'VE GOT TO GET IT DONE!"



Stuff
like this
takes a
**REAL ROCK
SHOVEL!**

On visits to jobs to get the real story of Northwests at work we often find many machines. It is no accident that almost invariably a Northwest is pioneering in the heaviest digging—the rock digging! "Why", we ask, "do you choose the Northwest for the rock work?" Always, the answer is the same, "We've got to get it done!"

Watch a Northwest Shovel at work in rock! The Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste. The swing is smooth. The load is spotted in one clean move. It's in the truck and the dipper is back in the bank.

Hour after hour—day after day—yard after yard, that's what makes production. Your Northwest is always ready to go. *We hear it everywhere and Northwest users will tell you so.* The "Feather-Touch" Clutch Control makes operation easy without resorting to pumps, compressors and other delicate mechanisms. The Cushion Clutch eliminates the detrimental effects of shock loads and makes ample power safe. It brings you a combination of advantages that has proved its ability to get high output in rock and make easy digging easier. It gets things done!

NORTHWEST ENGINEERING COMPANY
1504 Field Building, 135 South LaSalle Street
Chicago 3, Illinois

NORTHWEST

Always
Ready to **GO**

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS
¾ Yd. to 2½ Yd.
Capacity

CRANES
15-Ton to 60-Ton
Capacity

DRAGLINES
¾ Yd. to 3 Yd.
Capacity

PULLSHOVELS
¾ Yd. to 2½ Yd.
Capacity

TRUCK CRANES
25-Ton and 35-Ton
Capacity

... for more details circle 332 on enclosed return postal card

5-00-084



**Who says you can't
run boulders
THIS BIG
through a portable
gravel plant?**

Now you can...with Pioneer's

**THE REVOLUTIONARY
Big Red
PORTABLE
PLANT
FEATURING...**

No longer do you have to kick aside boulders larger than 8" across because the crushers on your portable gravel plant are too small... no longer do you have to leave them behind or bring in a primary crusher. And... no longer do you have to pull out of a pit before it's *really* depleted.

Mounting a 15" x 36" jaw crusher—*biggest ever carried by a portable duplex gravel plant*—Pioneer's Productioneer gobbles 14" boulders with ease. In addition, this all-new "Big Red" giant is equipped either with an oversize 40" x 30" twin roll crusher or a 36" cone crusher working in perfect balance with the jaw.

Big crushers like these require an equally large, high-speed vibrating screen... and the Productioneer really has it! The 5' x 14', 3-deck inclined screen provides 70 square feet of specification screening area.

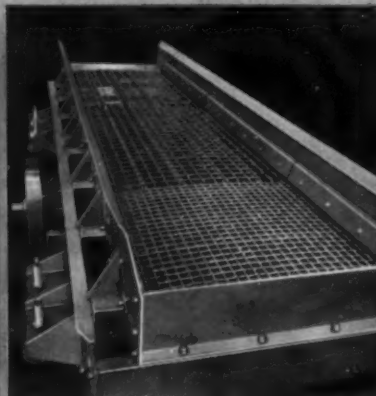
Conveyors, of course, are all 36" wide.

**1 15" x 36"
JAW CRUSHER**



Jaw opening is 50% greater than the size most commonly used... will accept boulders that are more than three times larger in volume.

**2 5' x 14', THREE-DECK
PRODUCTION SCREEN**

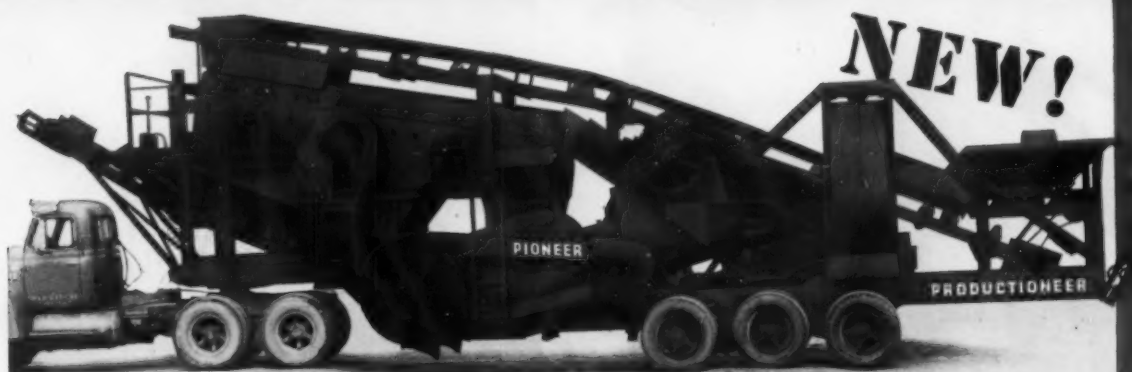


Six-inch clearance on both sides of top deck lets you change the second deck screen cloth from upper and without removing the top deck.

**3 40" x 30" ROLL
OR 36" CONE**



Plants are available with either cone crusher (above) or twin-roll crusher, and as either mechanically or electrically driven models.



Productioneer!

These 15 superior features mean you produce far greater tonnages at less cost per ton than ever before possible



Thoroughly field-tested, Pioneer's Productioneer is already at work in both midwest and mountain areas. Reports on these applications now warrant our saying that the Productioneer can virtually revolutionize current portable production practice.

- 1 Inclined vibrating screen runs at extra-high speed... is rugged enough to withstand 14" boulders.
- 2 Entire third deck or whatever portion you need can be used for sand rejection. Plant is ideal for working excessively sandy pits.
- 3 Hoppers and spouts are provided to produce up to three product sizes.
- 4 When you choose this plant equipped with a cone crusher, you get the only duplex plant on the market using a cone secondary.
- 5 When you choose a roll crusher equipped Productioneer, you get a full 30" of working shell surface, 25% wider than used on ordinary plants.
- 6 Both the jaw and the roll crushers are equipped with hydraulic-shim mechanism for easy adjustment.
- 7 Fully equalizing triple axle divides the bulk of the plant's weight evenly over twelve 9:00 x 20 pneumatic tires.
- 8 Rear assembly carries bucket wheel and hopper, detaches quickly without use of crane for increased travel ease. (See number one photo at left.)
- 9 Plant-mounted feeder is heavy-duty 36" size... runs on anti-friction bearings, has rubber impact idlers under feeder to protect the conveyor belt.
- 10 36" feed conveyor has ball-bearing, non-jamming clutch control. Wrap-driven for better starting.
- 11 Hand-controlled hydraulic pump lowers feed conveyor to reduce travel height.
- 12 Single 36" return conveyor handles product from both crushers. No transfer or extra conveyor to drive.
- 13 90" x 28" bucket wheel has mono-rail friction drive on hardened alloy steel rollers and rail. Flights are replaceable and reversible.
- 14 36" end delivery conveyor has 10' clearance, is independently controlled by clutch or electric push button.
- 15 All driving pulleys have vulcanized, herringbone rubber lagging... all non-driving pulleys (except main feed conveyor) are wing-type.

PLUS... many other time and money saving features. If big-time production is your goal, check into this brilliant new portable duplex gravel plant today!

LOOK FIRST
TO THE
Big Red
EQUIPMENT

Get all the profit-making details
from your Pioneer Distributor



BITUMINOUS MIXING PLANTS AND PAVERS



STATIONARY QUARRY AND WASHING PLANTS

Manufactured
by

Pioneer
ENGINEERING

DIVISION OF
POOR & COMPANY, INC.
Minneapolis 14, Minnesota

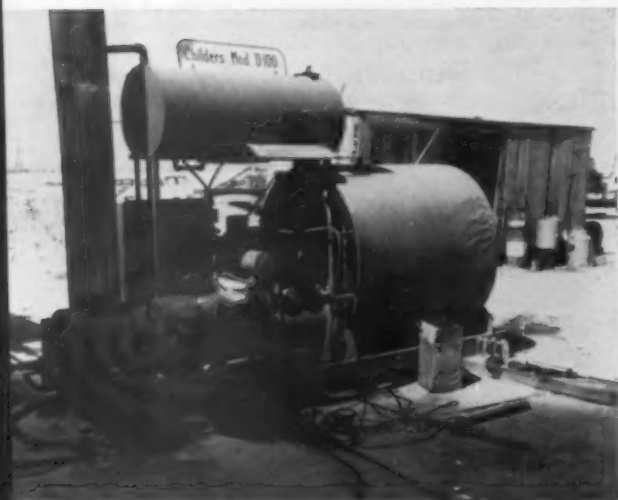
... for more details circle 356 on enclosed return postcard
ROADS AND STREETS, July, 1960



Contractor-built proportioning feeder bins, designed for ready portability along with other plant units.



Two diesel-electric generators in a single trailer—another unit all set to roll behind a semi-trailer.



Skid-mounted hot-oil heater, located just back of single big asphalt tank.

106



Busy First Year **for Portable** **Asphalt Plant**

Bituminous features appear
between pages 106 through 119.

Bituminous

Roads And Streets



Every component of this plant can be quickly set down on rubber tires for towing to a new location.

The pictures you see here show an asphalt plant which typifies the extreme mobility needed by contractors today, even when the plant is a big one. With quick portability, a contractor often can get more jobs and save a great deal of moving costs.

This plant was purchased by Cal-Quip Corporation of Bakersfield, California, in March, 1959. Its immediate work was to supply asphaltic concrete for Guy F. Atkinson Company's US 99 relocation through Grapevine Canyon south of Bakersfield. The black-top paving work was done by Dicco, Inc., an affiliate company of Cal-Quip.

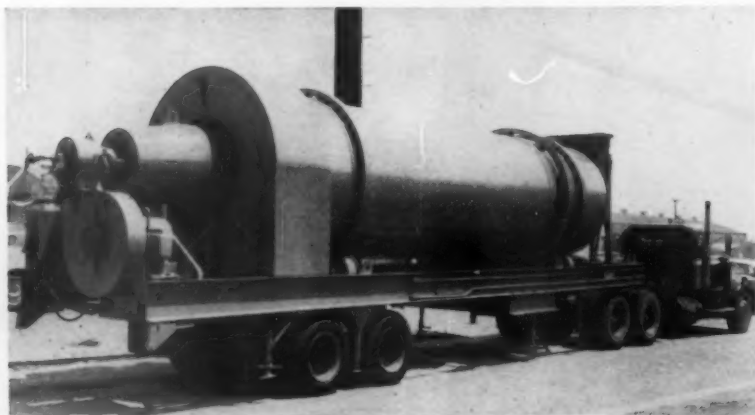
Spotted successively at four strategic points between the top and the bottom of the long Grapevine grade, the plant turned out 112,000 tons of mix on demand for the Atkinson project. And Dicco-Cal-Quip also found time to take advantage of a lull by moving 150 miles out into the adjacent desert to handle a separate 20,000 ton road surfacing job.

The plant is a Standard Steel Corporation Model S-E Self-Erecting Portable, with 5,000 lb. capacity pugmill and a 7' x 28' dryer. All components of the Model S-E are mounted on their own wheels and axles and are quickly movable. A

portable proportioning feeder for four aggregates, built by Dicco, Inc., supplied the raw aggregates to the plant. Since the work required only a single grade of asphalt, one 11,000 gal. storage tank sufficed, with another 8,000 gal. tank for diesel fuel. Other equipment included a Childers hot oil heater, Model D 100, and a wet dust collector.

Stockpiled aggregates were handled into the feeder by one and sometimes two Michigan front loaders. Three of the four feeder compartments were utilized for this setup, which required no mineral filler aggregate.

Asphalt Plant On The Move *Continued*



Showing how the dryer component of the Standard Steel Model SE 5000-lb. asphalt plant is taken over the road.



Another Model SE component—the mobile dust collector—being towed to the next job. It is placed in operation by spotting it accurately in position at the plant set-up, connecting a short duct, bolting the duct to a return screw, plugging in electric cables, and connecting the fan and dust return screw motors to the electric control panel.



A four-compartment cold feed bin, such as Dicco, Inc. used, seen also in transit.

The all-electric operation was powered by a pair of diesel generators mounted on a single trailer—one a Caterpillar V-engine and one a converted marine diesel plant.

The plant during early spring of 1960 produced 20,000 tons of mix at the pictured location, which was at the bottom of the big grade.

The contractor usually figures it takes three to four days to take the plant down, move it to another location, erect it, and get it back into production.

When the plant is trucked into its new position, the mobile bin section, which also contains the Standard "push button" hoist mechanism, is first pulled into position. The wheels are removed, and the bin section raised into place. Next, the mix and weight section is pulled into place, the wheels and axles removed, and then raised into position.

The hot elevator, with wheels attached, is then raised into its position, again using the Standard Model S-E's hoisting mechanism. The mobile dryer is then pulled into position, and the air duct, fuel and asphalt tanks, and other accessory equipment are hooked up. The plant is then ready to go back into production.

All of the erection is performed by the plant's own hoisting mechanism. No crane is needed for any of the operation.

The same procedure, in reverse, is followed when the plant is taken down for movement to another job site.

Daily production for roadway paving, shoulders, ramps and service roads, to meet Atkinson's irregular job requirements, ranged up to 1,500 tons per day. Batches of 5,280 lb. were eight to a semi-trailer dump truck. The mix was California Type B, with $\frac{3}{4}$ in. maximum stone and 85-100 penetration asphalt.

Mix was placed with a Cedarapids bituminous paver which ran at various speeds up to 104 ft. per minute, there being no speed limitation as such in the California job specifications. The parallel service road paving work pictured here was placed at 84 ft. per minute.

T. C. Latham is construction manager for Dicco, Inc. Jack McGee was construction foreman on this job.



BETTER
3 WAYS
FOR RURAL ROADS

ASPHALT

FROM ESSO STANDARD

GRADES TO SUIT YOUR JOB . . . Asphalt refined in a wide range of grades to stand up under traffic pounding, hold down maintenance costs.

QUICK AVAILABILITY . . . Asphalt from Esso is delivered from 5 refineries, 4 terminals. You can get the grades and quantities you need, when you need them.

UNSURPASSED TECHNICAL HELP . . . Salesmen who are qualified to give you fast, accurate advice when you

need it. They have the latest information on modern, cost-saving asphalt products for a wide variety of jobs.

If you would like specific information on any of the many uses of asphalt, write: Esso Standard, Division of Humble Oil & Refining Company, 15 W. 51st St., New York 19, N.Y.



ASPHALT PRODUCTS

In Industry after Industry... "ESSO RESEARCH works wonders with oil"



This report on bituminous mixture studies was prepared for the office of Detroit's City Engineer M. F. Wagnitz at suggestion of Glenn C. Richards, Director of Public Works; made available to Roads and Streets for the benefit of engineering and contracting personnel in other areas who may have similar bituminous mix design problems.

Starting concrete saw to remove undisturbed laminated layer of pavement—after marking out relocation of sample paper on pavement.

Detroit Upgrades Bituminous Mixes

Higher stability and other improved characteristics achieved for both all-slag and sand-gravel asphalt mixes

By Maurice Greenberg

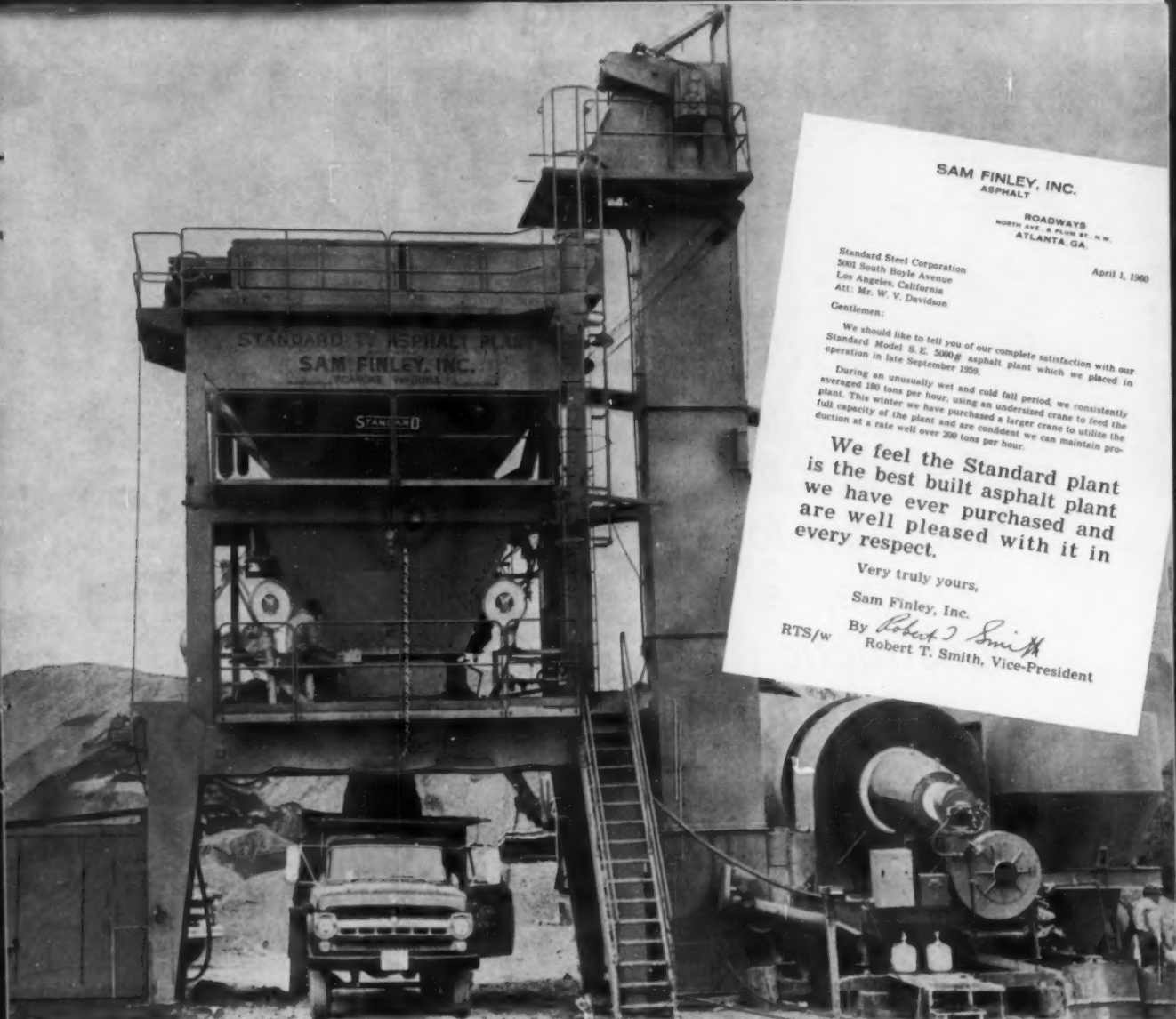
Engineer of Tests, Department of Public Works, City of Detroit, Michigan

In 1953, Detroit's Commissioner of Public Works, Glenn C. Richards, decided that there was extensive room for improvement of bituminous mixtures for the expanded street resurfacing programs in prospect. The minor studies made right after the war indicated a need for improvement in shove resistance and/or stability. This need was apparent especially in view of a vastly increased traffic load expected in the post-war expansion of industry and passenger traffic.

In addition, the commissioner and the city engineer saw areas for improvement and research in other materials such as aggregates for concrete, thermal plastic polymers, sealing compounds such as epoxy resins and tar latex emulsions, etc.

With these convictions in mind, the city staff centered several testing facilities in the works department into a Consolidated Testing and Research Laboratory. Its purpose

Continued on page 113



SAM FINLEY, INC.
ASPHALT

ROADWAYS
NORTH AVE. & PLUS ST. N.W.
ATLANTA, GA.

April 1, 1960

Standard Steel Corporation
5001 South Boyle Avenue
Los Angeles, California
Attn: Mr. W. V. Davidson

Gentlemen:

We should like to tell you of our complete satisfaction with our Standard Model S-E 5000g asphalt plant which we placed in operation in late September 1959.

During an unusually wet and cold fall period, we consistently averaged 180 tons per hour, using an undersized crane to feed the plant. This winter we have purchased a larger crane to utilize the full capacity of the plant and are confident we can maintain production at a rate well over 200 tons per hour.

We feel the Standard plant is the best built asphalt plant we have ever purchased and are well pleased with it in every respect.

Very truly yours,

Sam Finley, Inc.

By *Robert T. Smith*
RTS/w Robert T. Smith, Vice-President

SAM FINLEY, INC. says:

"BEST ASPHALT PLANT WE HAVE EVER PURCHASED"

This revolutionary new STANDARD Model S-E 5000 pound self-erecting, self-contained fully portable Asphalt Plant can be wheeled to the job-site, completely set up without the use of a crane, and producing hot mix within 48 hours! Manufactured in 4000, 5000, and 6000 pound batch capacities.

PUSH BUTTON ERECTION — Entire mixing unit is automatically raised into operating position.



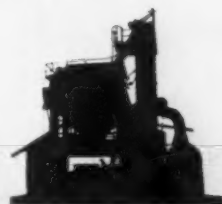
**STANDARD / Complete line of Asphalt Plants
2000 through 8000 pound capacity.**



**Model T-M • Trailer-mounted,
self-contained.**



**Model R-M • Semi-portable
and stationary**



**Model S-E • Self-erecting,
fully portable.**

STANDARD STEEL CORPORATION Manufacturers of: Asphalt Plants • Rotary Dryers • Kilns • Coolers • Cryogenics

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... for more details circle 336 on enclosed return postal card

Dragline gets inspection from Keith Hutchison, Greer vice president and technical director, Phil Owen and Chuck Daub (l. to r.). Owen and Daub are Standard Oil lubrication specialists who render the school technical assistance on lubrication problems. Both have engineering degrees and both have completed Standard's Sales Engineering School. Daub has ten, Owen five years of field experience serving commercial customers.



*Standard Oil
helps this
school teach
men how to
keep a
construction
job going*


Greer Excavating and Mechanics School has learned one of the lessons it teaches — how to keep equipment in service

Situation: Time is money at Greer Excavating and Mechanics School, Braidwood, Illinois. The school promises its students hours of experience operating equipment. It teaches them how to maintain and service the machinery they work with.

Up to 70 students, guided by nine experienced instructors, work 26 pieces of equipment almost every daylight hour, seven days a week, winter and summer.

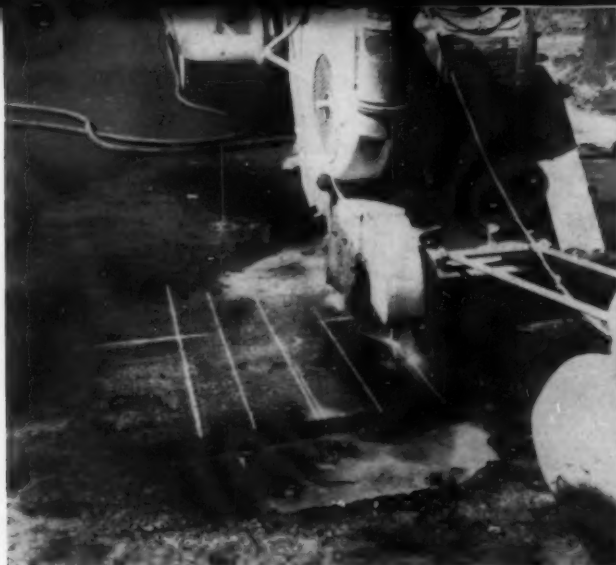
What was done: From the first day of school more than three years ago, Greer Institute's equipment has been serviced exclusively with Standard Oil gasoline, diesel fuel, motor oil and greases. Phil Owen, an experienced Standard Oil lubrication specialist from Joliet, just 20 miles from the school, makes regular calls to check out any lubrication problem. From Wilmington, only 5 miles away, Standard Oil agent R. J. Kavanagh makes deliveries of gasoline, diesel fuel, lube oil and grease as often as every other day.

What you can do: To get this kind of service call the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write, Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

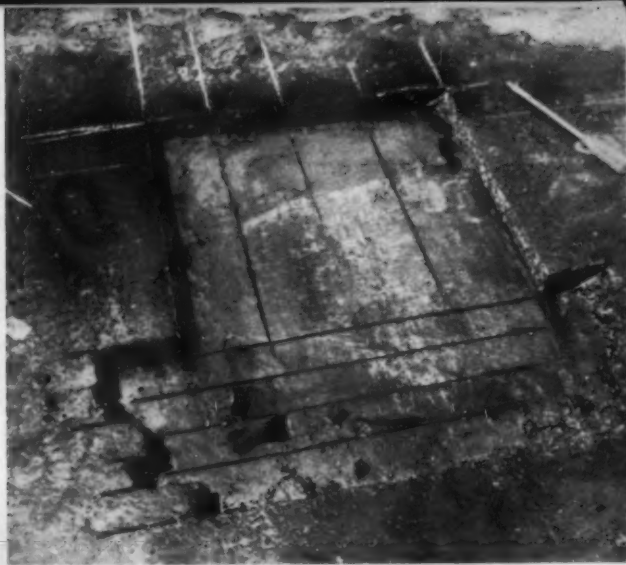
You expect more from  and you get it!

Plenty of dirt to work with. School site is on 1,700 acre tract that has been ripped, torn and piled as result of strip mining. Here student is learning how to operate skid shovel.





Cutting along edge of individual test bars. Last cut at back of sample made to free all bars.



Sample bars removed showing lower paper still adhering to tack coating below.

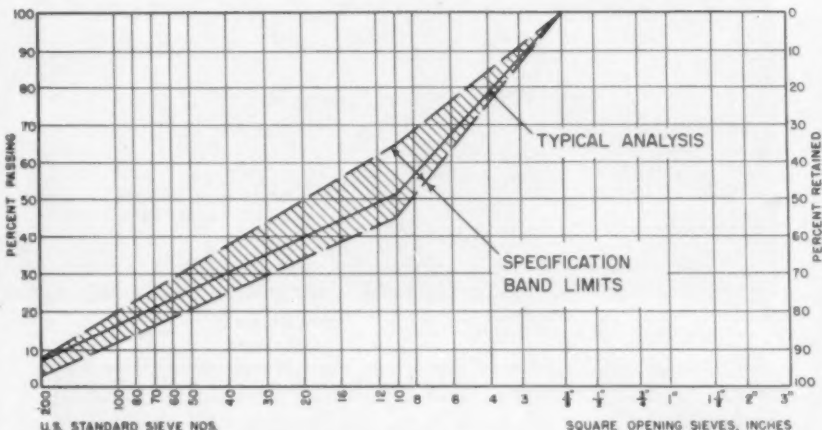
DETROIT UPGRADES

Continued from page 110

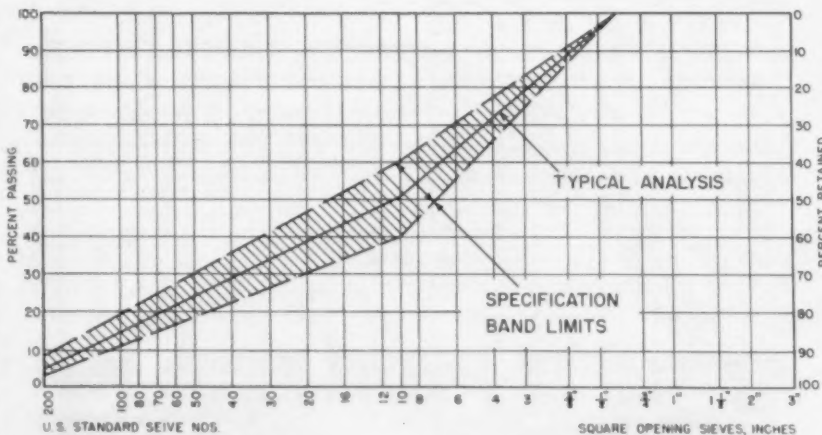
was to keep abreast of the new technological changes in the expanding highway and construction industry, and to investigate methods and materials which might do a better job for less cost to the taxpayer.

As a primary work, the first project was an investigation of the use of a local slag aggregate. This material had been under development for uniformity of quality and size control, factors which had not been fully controlled always in the past. The city had used great amounts of stone-sized slag as road material, and as stone in our bituminous binder manufacture. But little, if any, use had been made of complete slag mixtures. In 1953, the city let its first contract calling for all-slag bituminous concrete, composed of slag stone, slag sand (which contained enough fines to obviate dust addition), and asphalt cement. During this period the first investigations were carried out to determine the relative strength of all-slag bituminous mixtures.

At this time the well-known fact was re-established that, with rounded particle aggregates, a 60-40 mixture of coarse to fine material yields the most stability. It is also well-known that gradations which run 60 percent coarse aggregate are also very difficult to work; they are harsh and open in appearance. And they do not lend themselves to hand operation such as feathering out or intersection work where a great deal of hand work is neces-

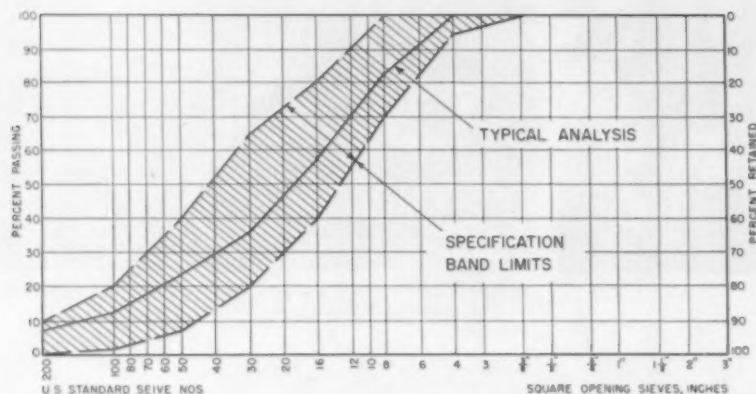


Gradation limits for Detroit's Type II bituminous concrete, for secondary street resurfacing, and a typical mix gradation: AC content 5.58%; Marshall stability 1,850; Marshall flow 12; mixture made with Detroit 31A natural crushed pebbles and 2NS sand.

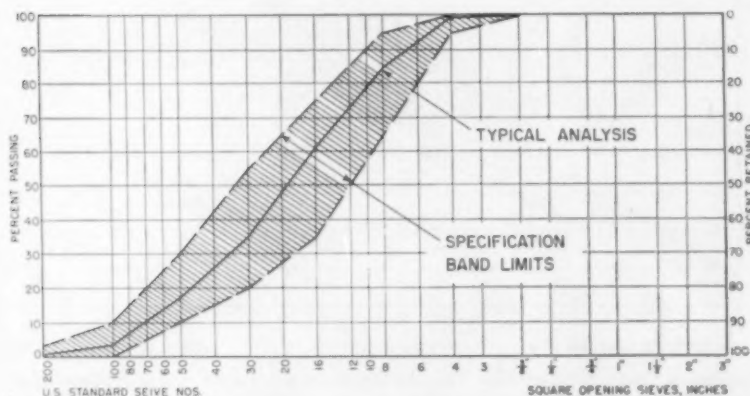


Type I bituminous concrete for primary street resurfacing. Typical analysis is for mix containing 7.56% AC; stability 2,692, flow 14, all-slag 25A mixture.

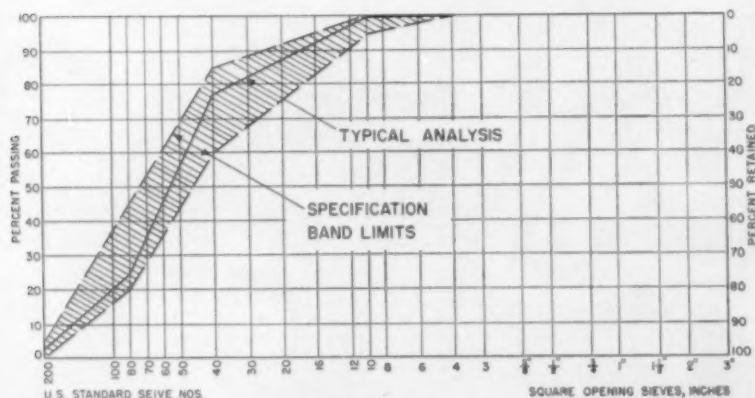
Additional Detroit Gradations



Gradation band and typical analysis for crushed iron-blast-furnace slag sand.



Gradation for natural sharp sand, state of Michigan designation, 2NS type.



Natural sand for sheet asphalt wearing surface; Michigan state highway designation.

sary. Due to these limitations of workability, mixtures of greater fines content are usually sought after by the contractor and city's construction divisions so as to get the job with the least inconvenience.

With the divergent requirements of workability on one hand, and some semblance of stability on the other, the bituminous engineer's job is a constant compromise between these demands. He is usually striving for some maximum stability while still maintaining a fair degree of workability.

It became apparent to all concerned with bituminous paving that, if well-graded aggregates could be secured which would satisfy the Furnas or Weymouth types of curves, instead of compromising between extremes to secure workable mix designs, perhaps the bituminous engineer could "have his cake and eat it too." As we are well aware, local availability of materials is often the most important facet of mix design. The bituminous engineer knows what will best serve his needs as far as mixtures are concerned, but if he cannot economically procure the materials, then it is useless to think in ideal terms.

In this instance, time, effort and expense were expended by the local slag processing company to secure the proper gradations and quality of material, thus making available a material, which closely followed the Furnas theory of broken solids.

In the late fall of 1953, an experimental section of Jefferson Avenue, a major thoroughfare, was placed, as well as a section of residential pavement. Since the mixtures were composed of slag stone and slag sand, including fines, the mixtures were referred to as "all slag mixtures."

Generally speaking, the workability was less than that for the mixtures which the city forces and contractors were accustomed to working with. The wellgraded mixtures were not made up of coarse stone and very fine sand, but under machine placement and hand working, the pavements were very uniform in appearance. The stability values, measured by Marshall test, indicated values in excess of 1,500 lb., a value recom-

Continued on page 117



Portland Profits By Resurfacing Streets With **CATIONIC BITUMULS**



Distributor applies Cationic Bitumuls at 0.2 gal./sq. yd. Note "skirt," designed to protect against drift or splash.



Truck immediately applies 25 lbs. of cover stone (1/4"-#10) using tail-gate spreader. Two passes by three-wheel steel roller completes job.

The City of Portland, Oregon, is about to complete its second successful season of Single Surface Treating city streets using Cationic Bitumuls.

Last year, Cationic Bitumuls was used on more than 80% of a total of over one million square yards of such work. Costs averaged out

at about 12 cents per sq. yd. as opposed to 16½ cents for similar work using an asphaltic cutback. This year, the program will include at least 800,000 square yards. Conservatively, this means a saving of over \$70,000 in two years!

WHERE THE ECONOMY DEVELOPS

According to officials in Portland, the savings can be traced to the following factors: less aggregate required; smaller crew; less binder; faster operation.

In addition, Cationic Bitumuls holds even siliceous aggregates. And it extends the working sea-

son because it gives extra protection against wash-off of binder when early rain is encountered.

FUTURE PLANS

Current plans call for a continuing program involving the resurfacing of 50 to 60 miles of streets each year. At this rate the City will continue to save approximately \$35,000 per year as compared to earlier methods.

Investigate the benefits of using Cationic Bitumuls in your street and road work. Call our nearest office for full information, today. Your community, too, can **profit** just as Portland is doing.



Here's the type of tightly bound surface being put down with Cationic Bitumuls in Portland, Oregon.



American Bitumuls & Asphalt Company

320 MARKET, SAN FRANCISCO 26, CALIF.
Perth Amboy, N. J.
Baltimore 3, Md.
Cincinnati 38, Ohio

Atlanta 8, Ga.
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St. Louis 17, Mo.
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Oakland 1, Calif.
Inglewood, Calif.
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DITUMULS® Emulsified Asphalts • CHEVRON® Paving Asphalts • LAYKOLD® Asphalt Specialties • PETROLASTIC® Industrial Asphalts

Piggy Back

**self-propelled
vibratory**

**ASPHALT ROLLER
SOIL COMPACTOR**

**Has effect
of 8-10 Ton
Tandem . . . Rides on
Back of Truck . . .
Eliminates Trailer!**



MODEL CL-21

Meet the newest member of the Terrapac family — the "Piggy Back" CL-21 vibratory workhorse . . . If you're interested in results, not claims, this self-propelled combination asphalt roller-soil compactor can be your most valuable piece of equipment . . . It will consistently achieve high production on asphalt and granular materials . . . Ideal for patch work — rolls flush with curb (frame raised 8" on one side) . . . Never idle — moves from job to job on back of your truck . . . Can be operated by any laborer . . . See this real eye opener — see the "Piggy Back" in action!

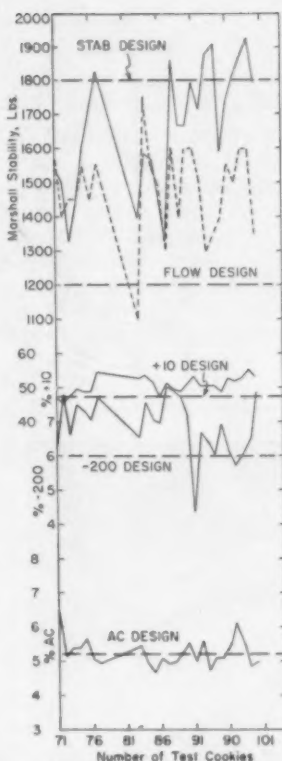
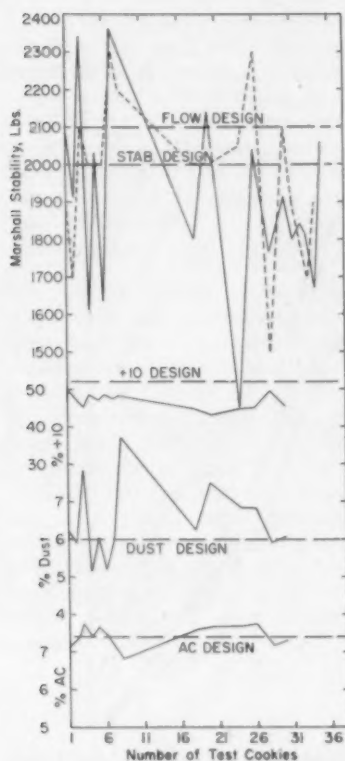


VIBRO-PLUS PRODUCTS, Inc.
STANHOPE, NEW JERSEY

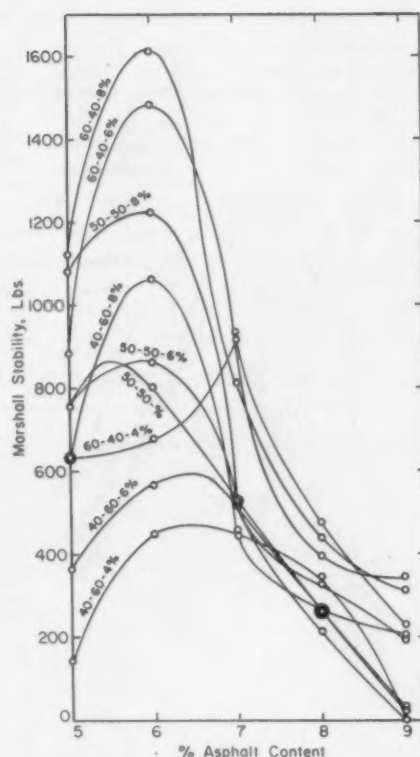
WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES.

AD 41-16

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Test data for typical samples. (Left): Detroit's 31A all-slag mix. (Right): Mix with 31A crushed pebbles and 2NS natural sand.



Stability and asphalt content vs. aggregate % composition for typical test specimens (plus No. 8 vs. minus No. 8). Shown for 31A all natural sand. (1955 test).

DETROIT UPGRADES

Continued from page 114

mended for our major streets so that shoving and rutting could be positively eliminated. In addition, another factor presented itself at this time; the vesicular nature of the crushed slag gave the city a lighter weight resurfacing material, which resulted in an increased coverage of pavement per ton of mix.

Contract work is let on the per-ton basis of mix in place due to the irregular nature of our old pavements; it is difficult to describe the surfacing in square yards at a given thickness. These factors were discussed in evaluating the many types of mixtures and materials used in the resurfacing work.

The apparent method which seemed expedient was to incorporate the increased yardage per ton into some form of evaluation factor, in order to secure an equalization between the normal method of tonnage estimating and that which would be required by using this

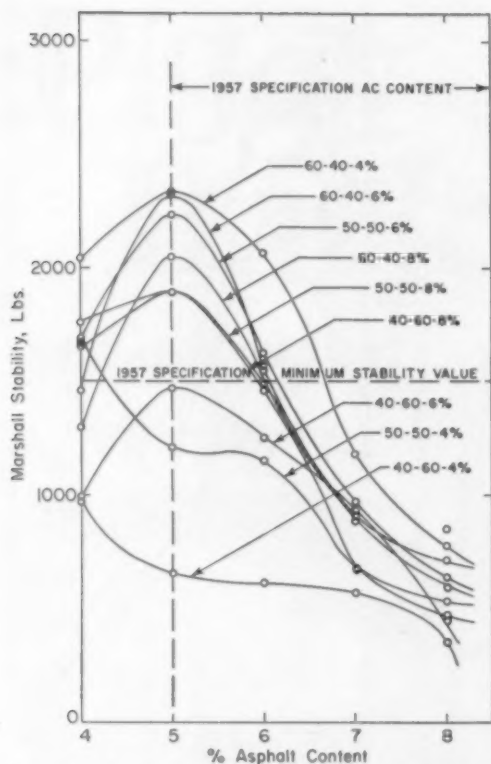
new material combination.

With experience lacking in determining the proper factor for this material, we decided on a study program to secure an accurate estimating factor for all-slag bituminous concrete. State highway departments elsewhere had used arbitrary factors compared to their normal method of preparing estimates, but these were mostly based on some purely academic single measurement associated with the coarse aggregate only. The plan set up in 1954-55 by our department was based on actual year-to-year measurement of samples secured from the field by a prepared paper interleaving method dubbed "Laminar Discontinuous Media Sampling." The method called for sawing out pavements that had been placed and compacted over prepared paper sites. Thus we secured a completely and reliably undisturbed sample. This sample was tested by means of a rubber

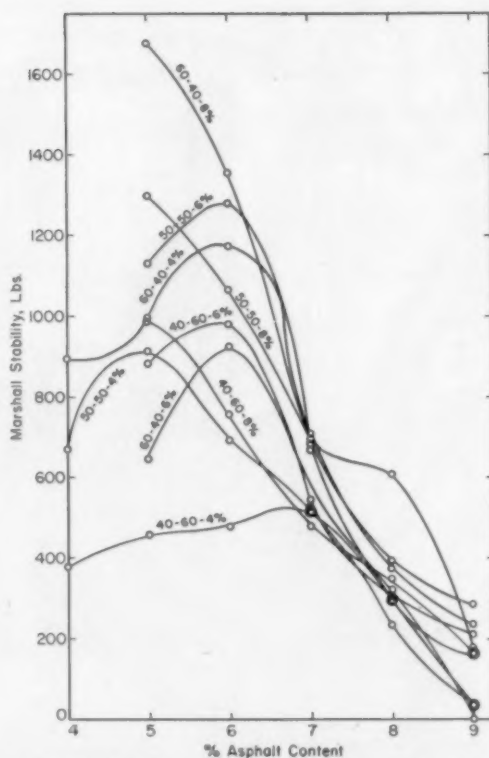
bag density determination, giving its density per square yard-one inch thick. This figure is used for estimating the tonnage of surfacing needed for a specific resurfacing job.

In the ensuing years, while data were being gathered, the use of all-slag bituminous concrete was increased and called for in definite proposals. Initial resistance to its use lessened as the city and contractor forces gained experience with the new mix. It must be recognized, however, that the availability and cost of materials do have a marked effect on a contractor's ability to use a specific material, regardless of virtues. Also that, depending on location, some contractors did not always find that an all-slag design could keep their price competitive in a remote location.

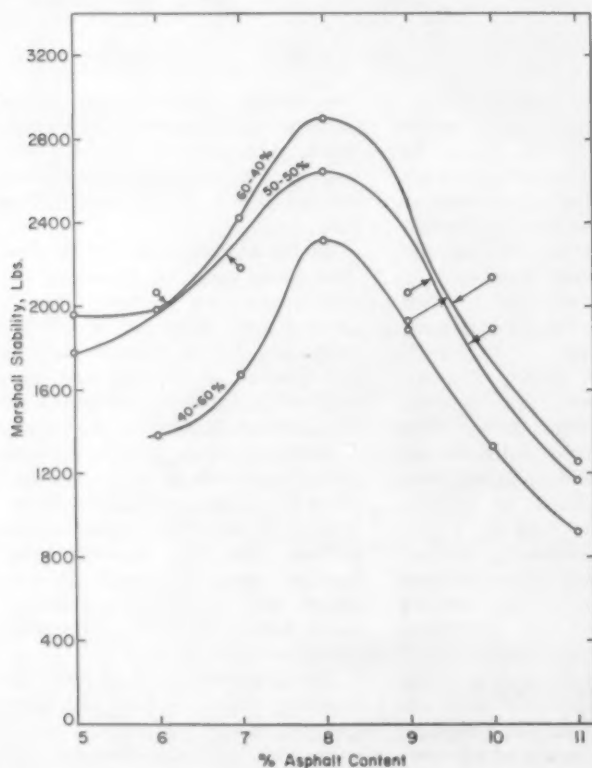
The new all-slag mix offered high stability, greater square yard yield per ton, slower loss of skid resistance with age, and uniform ap-



Test data showing variation in stability and aggregate content. Marshall stability vs. asphalt content, with 25A modified mix, crushed pebbles and concrete sand. (Aug. 1957).



25A modified all natural sand mix. Stability and asphalt content vs. aggregate % composition (plus No. 8 vs. minus 8). (1955).



25a all slag and slag sand (all slag mix). Stability and asphalt content vs. aggregate percent composition (plus No. 8 vs. minus No. 8). (1955).

pearance by both hand and machine work. But it was apparent to the laboratory staff that our bituminous mixtures made up of crushed pebbles, pit sands and fly ash had to be improved so as to maintain a competitive situation and thus promote a healthy American competition. After investigating local pit sands we found that a well graded sand, locally known as 2NS (concrete sand), apparently increased the Marshall stability of our mixtures to better than 1,500 lb. minimum value. And, above all, this sand allowed this increased stability, as with the slag sand, with a lower stone content in the total mixture.

In effect, we had procured a greater stability and at the same time secured a more workable mixture due to the use of the sharper particles, well-graded sand. An inspection of the typical gradation analysis and specifications require-

ments for slag sand and 2ND sand reveals that the gradations called for are not too unlike. The appearance of the finished pavements made up of all-slag materials and those made up of crushed pebbles, 2NS sand, and fly ash, are very close: the difference is hard to see at first glance.

In general, it is the feeling of the writer that the bituminous pavements have been improved by the introduction of quality slag aggregates in the Detroit area picture. If it had not been done, the industry and users of bituminous pavements might have been complacently satisfied with the status quo, and would have remained with gradations and stability results which were apparently acceptable for the past, but were inadequate for the present and future requirements of our roads and streets.

Asphalt Refiners Spend \$4 Million on Research

Refiners of petroleum asphalts will spend more than \$4 million on product research in 1960.

In his report to the Board of Directors, President J. E. Buchanan of The Asphalt Institute, College Park, Md., reported that a survey of member companies disclosed that \$4,100,000 is earmarked for research in the area of asphalt technology during the current year. These combined programs, he said, will employ 216 full-time researchers, engineers and technicians.

"This research," said Dr. Buchanan, "ranges from basic investigations into the molecular structure of asphalts all the way to new and improved applications of the refinery product."

Dr. Buchanan also reported that asphalt and road oil sales in 1959 climbed to a record high of 20.9 million short tons, an increase of nearly 1.6 million tons over the 1958 figure. He pointed out that this 8 percent increase fell short of the anticipated 10-12 percent increase, but attributed the disappointing tonnage rise to a siege of bad weather and federal highway fund shortage which curtailed high-

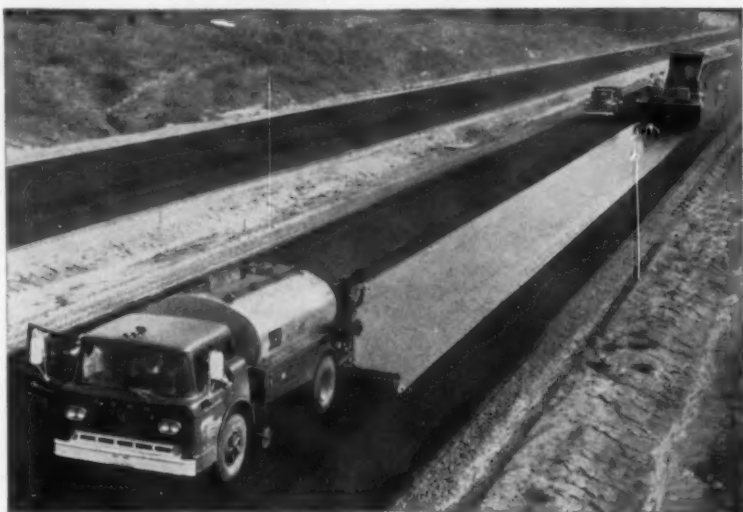
way paving late in 1959.

Paving accounted for more than 15.7 million tons of asphalt in 1959.

Regarding prospects for asphalt sales in 1960, Dr. Buchanan was guardedly optimistic. Hopes for another record tonnage year already have been dampened by an exceptionally wet spring which delayed paving operations, especially in the eastern states which are heavy asphalt users. However, said the As-

phalt Institute president, a sustained spell of good construction weather from here on in could easily take up the slack and push asphalt sales in 1960 to another all-time peak.

Members attending the mid-year meeting at Glacier Park Lodge represent 58 refiners of asphalt from crude petroleum, in the United States and overseas, including most of the major oil companies.



Designed for maximum payload ...the new Etnyre model FX-500!

Talk about payload! Compare these Etnyre capacities to *your* state load limits: 1550 gallons for single 18,000# axle

1690 gallons for single 20,000# axle

1840 gallons for single 22,400# axle

You can count on similar greater maximums on semi-trailer single and tandem axle mountings too! And dependable operation, and uniform, accurate distribution are always typical of the results you can expect from an Etnyre. Look at the sharp, clean edges and the even distribution in the above photo of an Etnyre FX-500 and you can see the results of Etnyre's exclusive triple-lap coverage.

OTHER FX-500 QUALITY FEATURES:

- Hardened aluminum jacketing over 2" Fiberglass insulation which is reinforced with molded asbestos blocks
- Stainless steel jacket near burners and exhaust stacks
- Stainless steel heat jacket for pump
- Aluminum fenders and mud flaps.

You're familiar with Etnyre's accuracy and dependability . . . now you can get maximum payload too . . . for maximum profit. Investigate today — find out how a "Black-Topper" can handle more work . . . faster . . . better . . . more economically.

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS



. . . for more details circle 299 on enclosed return postal card

NEW PRODUCTS

Listed here are reviews of new and improved equipment items, selected to aid our readers in purchasing. See reader service numbers on enclosed postcard.*



Tractor-Scraper Combination

Tractor-Scraper Combo

A new large-capacity self-loading tractor-scraper combination is being introduced to the market by LeTourneau-Westinghouse.

This rig, known as the Hancock Elevating Scraper, has a 10 cu. yd. capacity and features a "chopping action" slat-type elevator. The elevator chops and pulverizes the material and carries it off the scraper blade high into the bowl. The combination is the L-W "D" and the Model 10E2 scraper. The road speed of the "D" is 30 mph.

LeTourneau-Westinghouse Co., 230 NE Adams Street, Peoria, Ill.

For more details circle 101 on Enclosed Return Postal Card.

Wheeled Traxcavator

Availability of the Caterpillar 966 Traxcavator, second in a line of wheeled front end loaders, has been announced by Caterpillar Tractor Co.

The 966 is a 140 hp. unit with a 2 $\frac{3}{4}$ cu. yd. bucket. Featured is the open cockpit, which permits easy accessibility from either side, and the location of the loader lift mechanism completely ahead of the compartment. With a maximum lift height capacity of 154 in. and a reach of 35 in. at that height, the bucket has a tilt back of 41 deg. The machine has a 24,000 lb. breakout force and a turning radius of 20 ft. 9 in. at

the outside rear tire. Equipped with a two-speed power shift transmission, the unit has four operating speeds and can be worked in all phases of the production cycle with one forward-reverse shifting. A high-low speed selector and the two-wheel, four-wheel drive selector



Wheeled Traxcavator 966

are both located on the left alongside the operator's seat.

Caterpillar Tractor Co., Peoria, Ill.

For more details circle 102 on Enclosed Return Postal Card.

Grader Blade Control

The Preco "all-transistor" Dial-A-Slope automatic blade-control is available for installation on the LeTourneau-Westinghouse line of motor graders. According to the joint announcement by L-W and Preco Incorporated, the well known automatic control system can easily be installed on any new or used, current model L-W grader.

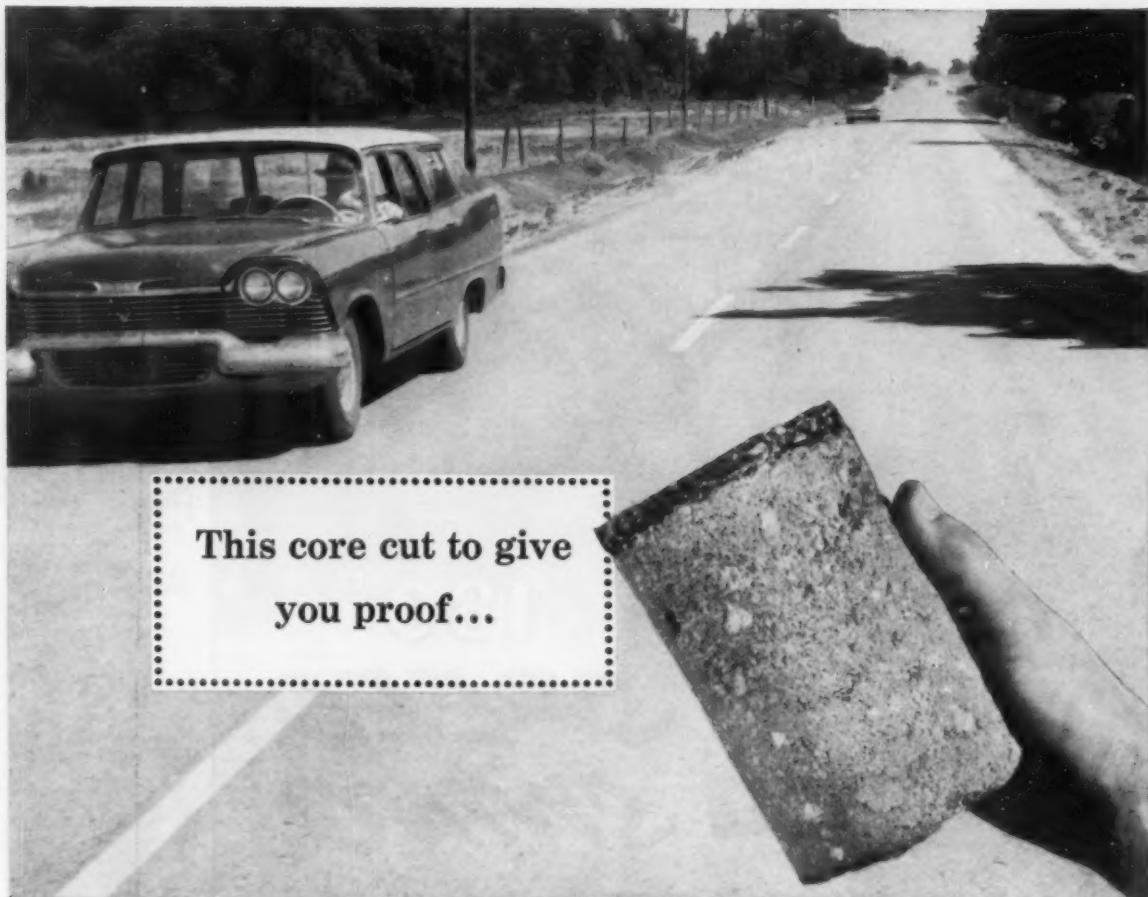


Preco Dial-A-Slope

Through the use of this new accessory in every phase of operation from roughing in to finishing, the productivity of the motor grader can be greatly increased, the manufacturer avers.

Continued on page 123

*To readers outside of the United States—postal rules forbid use of business reply cards outside of the U.S. Please write to us listing the numbers, month and name of magazine, and mail with your name and address to Inquiry Dept., Roads and Streets, 22 W. Maple St., Chicago 10, Ill., U.S.A.



County road south of Alda, Nebraska, was built in November, 1958, using materials from the old gravel road and 6.5% cement. Core-tested in July of 1959, it registered 560 psi.

Pavement strength up 15% in 8 months on this Hall County, Nebraska, road

...soil-cement pavement grows stronger year by year!

Core tests show soil-cement gains strength from the first day it's laid . . . and keeps gaining in strength month after month!

Inch for inch, soil-cement is the strongest low-cost pavement. It provides beam strength that spreads traffic loads over the subgrade. It stays level and unrutted

yet its initial cost is really low.

In fact, 75% of the materials are usually free. Soil, old gravel roads, or broken-up blacktop, can be the main ingredients. Just mix them with portland cement and water—roll solid, let harden, then top with a thin bituminous surface. Experienced crews using modern machines can lay up to two miles a day.

And this is low-maintenance-cost pavement—it stretches road budgets, lets engineers plan ahead.

Soil-cement is the fastest-growing low-cost pavement for roads, streets, shoulders, subbases, airports and parking lots.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of portland cement and concrete

**MODERN
soil-cement**

REPLACES **4** TO **7** MACHINES



PETTIBONE

**180°
SPEED
SWING**

ALL-PURPOSE MATERIAL HANDLER

NOW—the *all-purpose* material handler that gives you one-man crew advantages. It's the soundest investment of all for your requirements because it does *all* the jobs . . . earns its way on one application after another. And its usefulness is multiplied to the extent that it replaces single-purpose, specialized equipment!

The best features of all material handling machines are combined in the Pettibone Speed Swing, plus the *exclusive* 180° boom swing—90° left or right—to make it the most efficient, *most versatile* all-purpose material handler in the field.

Example: shown above, the Speed Swing backfills a sewer trench. The

180° boom swing permits it to work parallel to the trench in a confined area with no gee-hawing or maneuvering of the machine. Traffic is not disrupted . . . can move safely in other lanes. Other applications are numerous: park and street maintenance, tree removal, culvert installations, loading and spreading materials with high speed operation, loading out old curbing and sidewalks, snow removal—to mention a few. And all on a cost-cutting operation basis. Shown at right, 10 quickly interchangeable attachments (by changing *only* 3 pins) that make the Speed Swing the *most adaptable*, *most versatile* all-purpose material handler of all!

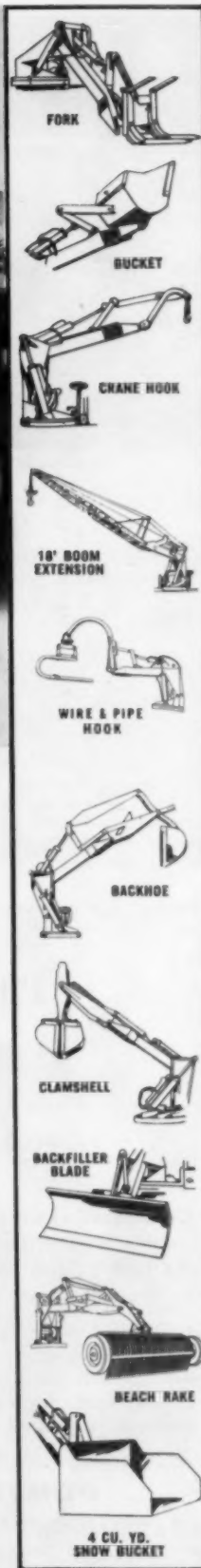
Get the facts on how the Pettibone 180° Speed Swing can reduce your equipment investment, as well as your maintenance costs.

PETTIBONE MULLIKEN CORPORATION

4700 W. DIVISION ST.

CHICAGO 51, ILLINOIS

SPaulding 2-9300



. . . for more details circle 334 on enclosed return postal card

New Products

Continued from page 120

The motor grader operator's job is simplified since the automatic control frees him from necessity of constantly adjusting both left and right blade lift levers in order to maintain the proper degree of transverse blade slope. With this new control in operation, the operator needs to watch only one end of the blade and operate the lift lever which controls it; the other end automatically adjusts itself, maintaining preselected blade slope.

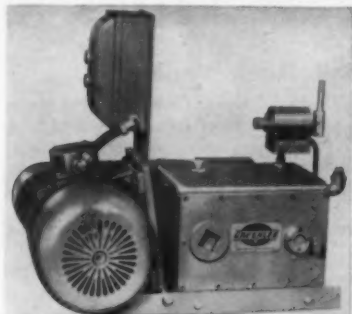
Le-Tourneau Westinghouse Company, 2301 NE Adams Street, Peoria, Ill.

For more details circle 103 on Enclosed Return Postal Card.

Power Pumps

Two new high-pressure power pumps, the No. 797E-TA and No. 797VE-TA manufactured by the Greenlee Tool Co., are designed specifically to speed operation on a wide variety of hydraulically activated equipment.

The No. 797E-TA features a simple radial-type pump, four-way spool-type control valve, and spring centered, three position valve control handle. Pump is equipped with V-belts, pulleys, belt guard, and motor mounting frame



Greenlee 797E-TA Pump

(NEMA 184 & 213) but without motors, controls, or hose. When powered by 3-hp single or polyphase 60-cycle motor, pump delivers 213 cu. in. per min. of oil at 10,000 psi. With 2-hp motor, pump delivers 106 cu. in. per minute. The No. 797VE-TA is identical to the No. 797E-TA but includes an auxiliary low-pressure pump mounted on top of pump housing. This pump provides a high-volume delivery of 5 gal. (1155 cu. in.) per minute of oil up to 800 psi and automatic change-over to 213 cu. in. up to 4,500 psi and 106 cu. in. up to 10,000 psi.

Greenlee Tool Co., Rockford, Ill.

For more details circle 104 on Enclosed Return Postal Card.

3-Piece Hydraulic Boom

A new three-piece, high lift boom, with hydraulically-telescoped reachability, is now available as standard

equipment on the Bucyrus-Erie Model H-3 (Series Two) truck-mounted, all-hydraulic crane-excavator.

According to the announcement from the manufacturer, the new flexible-reach boom is fabricated of alloy steel and features a tip section with gooseneck boom point. The telescoping intermediate section is hydraulically extended or retracted—"inched" up to 9 ft. 4 in. by means of a single-acting telescoping ram. Fully extended, the boom is 45 ft. long. A simple pin arrangement for locking tip section in position permits long or short boom setups in a matter of minutes. For work in cramped quarters, the upper and intermediate sections telescope into the lower section to form a working boom 15-ft. 9-in. long. The short boom rests over the truck cab for road-speed travel.

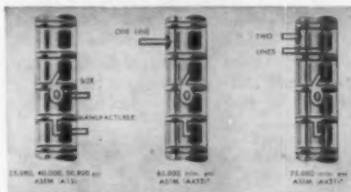
Bucyrus-Erie Co., South Milwaukee, Wis.

For more details circle 105 on Enclosed Return Postal Card.

Reinforcing Bars

High-strength multirib reinforcing bars manufactured to satisfy the Ultimate Strength design methods approved by the A.C.I. Building Code, and carrying rolled-in markings for immediate identification, are now being produced by Laclede Steel Company.

The new bars conform to two new standards adopted by the American Society for Testing Materials: A-432, for 60,000 psi minimum yield point



Marked Laclede Bars

steel; and A-431, for 75,000 psi minimum yield point. The bars are identified for grade by one and two longitudinal ribs, respectively, rolled into the bars at time of manufacture. Laclede bars in other grades also carry rolled-in identification markings. The identification system also includes a number designating the bar size, and the letter "L" for company of origin.

Laclede Steel Company, Arcade Building, St. Louis, Missouri.

For more details circle 106 on Enclosed Return Postal Card.

Bearing Puller

A special pulling tool, designed to make removal of bearings in conveyor rolls an uncomplicated job, has been announced by the Parts and Service Departments of Universal Engineering Corporation.

Roller stub shaft is first removed, and the expandable puller bolt, inserted in its place. The expanding bolt is then turned in until the bolt is hold-



Universal Bearing Puller

ing tight and the pulling lips are seated firmly behind the inner ring of bearing bore. From then on, a few twists on the puller nut pulls the bearing out of its seat in the roller. A new bearing can then be inserted into the vacated seat.

Parts and Service Department, Universal Engineering Corporation, Cedar Rapids, Iowa.

For more details circle 107 on Enclosed Return Postal Card.

Tracked Traxcavator

A new track type Traxcavator equipped with power shift transmission, the 977 Series H has been announced by Caterpillar Tractor Co.

Powered by a new, compact turbo-charged diesel engine, the 977H is rated at 150 hp. A 2½ cu. yd. bucket is now standard. Single lever shifting replaced the master clutch, and the operator can choose between a high



Series H Traxcavator

and low work range, each of which has two gear speeds forward and reverse. A new hydraulic system reduces bucket cycle time and delivers greater lifting force. The rig has a 40 deg. bucket tilt back, three grouser track shoes and hydraulic steering boosters. A new, vertical gasoline starting engine is standard and provides in-seat starting. A 24 volt direct electric starting system is available as optional equipment.

Caterpillar Tractor Co., Peoria, Ill.

For more details circle 108 on Enclosed Return Postal Card.

Two New Rippers

American Tractor Equipment Corporation offers two new 1960 models of ATECO heavy duty rock rippers for the Euclid C6 tractor.

Improvements include higher tool beam clearance, straight line draft, large hydraulic cylinders and rods, beefed up connecting pins and hardened bushings, and extensive use of

New Products



ATECO HR-C6

heat-treated alloy steels. The Model HR-C6 is equipped with standard straight tool beam for usual rock and pavement ripping, subsoiling, etc. Model HR48-C6 features a "pipe-line" tool beam which places the center shank 20" back of the straight beam position, providing a 48" lift to accommodate special long shanks for pipe line or cable-laying operations. Both models handle 1, 2 or 3 shanks (straight or curved) for digging depths or 25 in., 43 in. or 48 in.

American Tractor Equipment Corporation, 9131 San Leandro Blvd., Oakland, Calif.

For more details circle 109 on Enclosed Return Postal Card.

Concrete Placing Truck

A complete new truck, the smallest of the lot, has been added to the Scoot-Crete concrete placing truck line manufactured by Getman Brothers.

The new truck, Model N-12, measures 72 in. long, 35 in. wide, and 38 in. to top of dump body. The carrying capacity is 12 cu. ft. struck measure or up to one ton, and the dump body is completely controlled from the driver's seat. The new unit has four speeds forward and one speed reverse; worm and worm gear steering completely enclosed, running on oil with anti-friction bearings. The truck is powered by the Wisconsin Model AENLD single cylinder, air cooled gasoline engine developing 9.2 hp. It has heavy duty differential type drive axle assembly located directly under the load.

Getman Brothers, South Haven, Mich.

For more details circle 110 on Enclosed Return Postal Card.

Engine Generators

Winco Engine Generators with a new high level of generator power performance have been announced by Wincharger Corporation, a subsidiary of Zenith Radio Corporation.

The increased power performance results from a new generator design feature called Maxi-Watt. In announcing these new generators, it was reported that maximum power is available for heavy inductive loads beyond the probable capacity of generators of like size; the 4B23S2D-F Series engine generators are rated at 4,000 watts. They will start and power a 3 hp mo-



Winco Maxi-Watt Generator

tor under full rated load; or will safely carry a 4,000 watt load of lights on a single 115 v. or 230 v. circuit; or will carry many typical standby loads beyond the capacity of 3,500 watt or 4,000 watt generators.

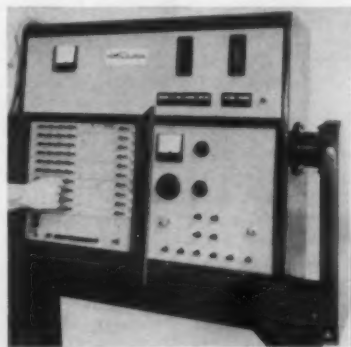
Wincharger Corporation, subsidiary of Zenith Radio Corporation, Sioux City, Iowa.

For more details circle 111 on Enclosed Return Postal Card.

Batching Console

A new, compact batching console, the selectron, featuring a simple system for pre-setting multiple formulas and operating batching plant remotely is manufactured by the Noble Company.

Up to 10 different formulas of 10 different materials can be pre-set in advance. Additional formulas in increments of 10 are optional. Selection of formula or change from one formula to another is immediate. Individual re-



Noble's Selectron

mote dials permit reading of up to 8 corresponding dial scales on batch deck. This enables the console to be positioned remotely at any desired location. The electronic components of the console are convenient sub-assemblies, easily interchangeable and not affected by vibration, the manufacturer states.

Noble Company, 1860 7th St., Oakland, Calif.

For more details circle 112 on Enclosed Return Postal Card.

Safety Items

Industrial Products Company has developed several applications for their vinyl-bonded-to-nylon material, Ray, D-8.

Now Ray-D-8 hard hat covers are available, supplied in one style to fit all makes and sizes of hard hats. Used in conjunction with IPCO Ray-D-8



IPCO Ray-D-8 Hat Covers

vests, they permit on-coming traffic to more easily spot road crews at work along the highway. Full cut, bib style vests have a solid panel front and back which prevents gapping.

Industrial Products Company, 2924 N. Fourth St., Philadelphia 33, Pa.

For more details circle 113 on Enclosed Return Postal Card.

Ball Hitch Trailer

Designated the TF-8, this new 8 ton capacity trailer is specifically designed for hauling street sweepers, tractors, small rollers and other smaller utility equipment.

Featuring a removable ball hitch assembly with a heavy duty jack leg for



TF-8 Trailer

easy, one man hitch removal and attachment, the trailer is designed to permit front or rear end loading. Standard equipment includes spring suspension, tubular axles, four 8-14.5, 12 ply, tubeless tires, Warner electric brakes and I.C.C. lights.

Talbert Trailers, Inc., 7950 W. 47th Street, Lyons, Illinois.

For more details circle 114 on Enclosed Return Postal Card.

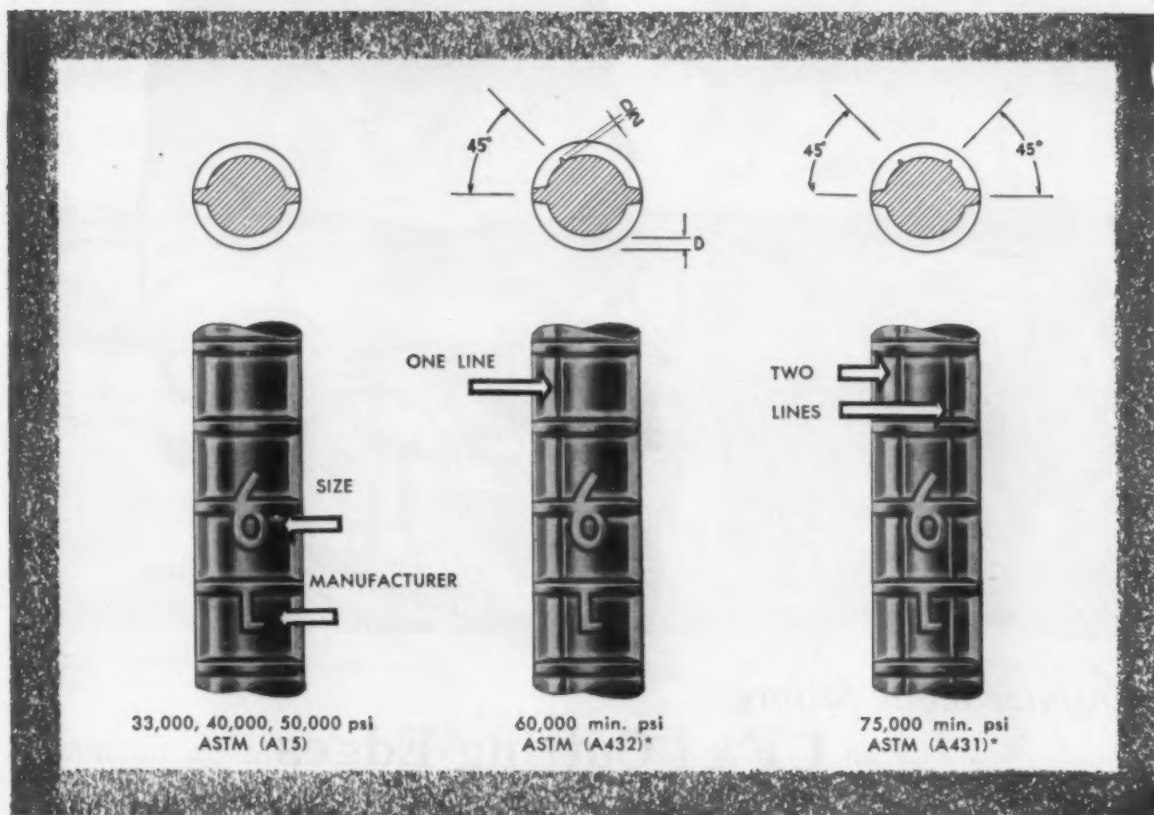
Fluorescent Enamel

A highly visible fluorescent enamel for emergency safety marking with a new type finger-tip spray dispenser is

Continued on page 129

NOW...

Every LACLEDE Multi-rib Reinforcing Bar is Marked to Show SIZE and STRENGTH...



Standard high strength steels* permitting greater economy and efficiency in reinforced concrete design under the provisions of the new A.C.I. codes must be **identified**. Recognizing this need, each Laclede Multi-rib reinforcing bar can now be completely identified as to size, strength and origin through a new rolled-in marking system. This assures the designer, contractor, and code writer that the proper grade of reinforcement is used on the job.

Demand these new time-saving Laclede bars for your next construction job.



LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI



Producers of Steel for Industry and Construction

... for more details circle 327 on enclosed return postal card

ROADS AND STREETS, July, 1960

125



minimize blade failures...

use **CF&I Cutting Edges**

This giant steelman is a reminder that at CF&I there is no compromise with quality. This policy of making only the best possible steel products for all industries is reflected in CF&I Cutting Edges—designed to last longer under the toughest conditions.

It makes good sense to buy quality cutting edges because they reduce equipment downtime. Made of special analysis steel, CF&I Cutting Edges are quality controlled throughout every

step of production to assure maximum resistance to abrasion and breakage. Therefore, CF&I Cutting Edges will give you longer service life.

CF&I Cutting Edges are available from more than 700 distributors who can give you fast service on the *right* blade for your job. They carry stocks of curved or flat blades for many different types of equipment.

Contact the nearest CF&I sales office for full details.

FREE! Send for new 32-page catalog, "CF&I Steel Products for the Construction Industry".



CUTTING EDGES

THE COLORADO FUEL AND IRON CORPORATION

In the West: THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita
In the East: WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

7073

... for more details circle 294 on enclosed return postal card

Put your finger on a

NEW, PROFITABLE READY MIXED CONCRETE MARKET

... Sell concrete for highway construction with a BUTLER HP-85 Portable Ready Mixed Concrete Plant

READY MIXED OPERATORS ... Take advantage of the swing to ready mixed for highways. It's a new source — an additional source — for substantial profits.

And the highway contractor will welcome you as a prime contributor to greater earnings in his pocket. Here's why:



With this purchase of ready mixed concrete from you, he eliminates a \$50,000 dual drum paver.



And he eliminates a high-priced, 5 man paver crew



— as well as a batching plant and batch trucks.



With concrete from your completely automated BUTLER HP-85 Portable Plant, the contractor gets a uniform, inspector-pleasing, non-segregated mix, pin-pointed to any specification —



and he speeds up his job with less supervisory headaches and overhead.

Production up to 200 cubic yards an hour

A Butler HP-85 Portable Ready Mixed Plant, completely automated, equipped with two turbine-type mixers, easily charges your transit mix trucks at the rate up to 200 yards an hour. That's enough to keep ahead of any highway demand — without a single bead of sweat.

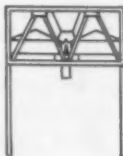
And Butler simplified, in-place, quick-connected automation is interlocked against human error. You have faster batching for every material, water included, with a perfection in accuracy that makes friends of tight specifications, the inspector and your contractor-customer.



WITH BUTLER PROFIT- PORTABILITY YOU SELL HIGHWAY CONCRETE 100... 200... 500 MILES FROM YOUR OFFICE

Here's a picture story of transport and erection — the ultimate in portability.

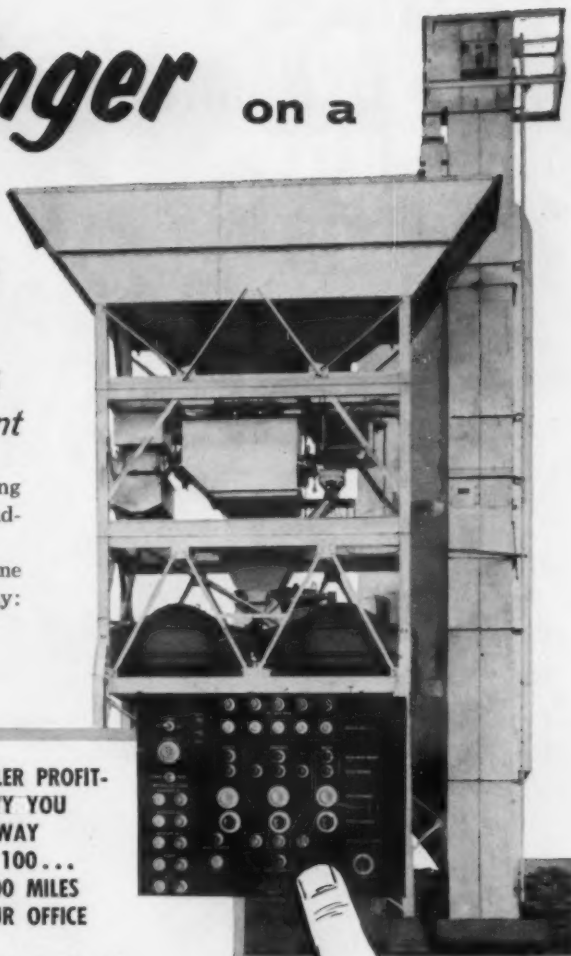
- The compartmented bin section ships complete with lugs attached for crane lift.
- Batcher section is a complete unit with all piping, wiring, batchers and automatic controls in place, ready for plug-in.
- Mixer section is also a complete unit with two turbine mixers, gates and controls pre-installed. Circuitry is completed with plug-in quick connectors. Support columns ship separately. These are quickly pinned to the mixer platform and swing into place as the mixer section is raised.



On a highway job, a move to the next section is made as quickly as with a batching plant — in fact faster than most.

BUTLER BIN COMPANY

959 Blackstone Avenue • Waukesha, Wisconsin



For healthy business and profit growth in this new market, send for the new, detailed BUTLER HP-85 Bulletin. Just jot your request on a postcard. You'll get a prompt reply.

THERE'S DYNAMIC DURABILITY DIFFERENCE...



621

"We'll pocket MAINTENANCE COSTS for 10 years— by switching to Hercules aluminum dump trailers!"

Reports C. R. Leffler Trucking Company, Richland, Pennsylvania

"Each of our five Hercules aluminum dump trailers provides about 3000 lbs. of extra payload per trip," says Carlos R. Leffler, owner of the C. R. Leffler Trucking Company, Richland, Pennsylvania. "But that's only a part of the *total savings* we got by switching from 22-ft. steel bodies to 24-ft. aluminum dump trailers . . . for hauling coal, slag, stone, ferromanganese and sand.

"Our Hercules *aluminum* bodies are sturdier, less easily damaged, and *require no painting or other maintenance*. This holds upkeep and downtime costs

to a minimum. On initial cost, we figure added payloads will take care of the difference in about 14 months. We estimate our Hercules aluminum dump trailers will be in service 10 years, or longer.

"*This means, we expect at least 8½ years of profitable increased payloads, plus better appearance and all the other advantages provided by aluminum equipment.*"

Want to know what Hercules aluminum dump trailers can do for you? Why not check with your Hercules distributor or write Dept. C-760.



Hercules

**DUMP BODIES, HOISTS
AND DUMP TRAILERS**

HERCULES STEEL PRODUCTS COMPANY • GALION, OHIO • U.S.A.

. . . for more details circle 312 on enclosed return postal card

New Products

Continued from page 124

now available from the Du Pont Finishes Division.

Known as the "Jet-Pak," the aerosol sprayer consists of three elements; a can of propellant, an unbreakable plastic spray head, and a glass jar which holds the thinned fluorescent enamel. Useful for stenciling emergency signs and road marking, the enamel comes in yellow, vermilion, orange, and red. The manufacturer states that the colors increase in brilliance in poor light.

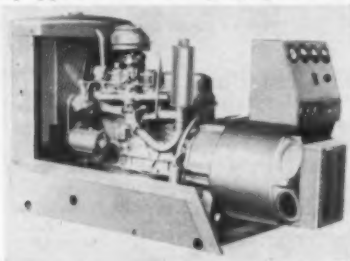
Spray On Products Co., Cleveland, Ohio.

For more details circle 115 on Enclosed Return Postal Card.

Magneciter Generator

The new Onan Magneciter Generator was developed by D. W. Onan & Sons for use with their own line of engine generator sets and will now be installed as standard equipment on all 25KW gasoline driven electric plants, according to the manufacturer.

The 25,000 W. gasoline plants are equipped with Ford 223, 69 hp. engine,



Magneciter Generator

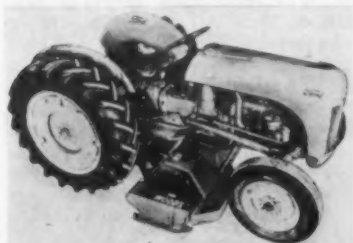
the generator and control panel, all assembled into one unit. The manufacturer suggests that they be used for primary or standby applications. Rated 31.25KVA at 0.8 power factor, it is available in all standard 50 and 60 cycle voltages to 600 volts.

D. W. Onan & Sons, Inc., Minneapolis 14, Minn.

For more details circle 116 on Enclosed Return Postal Card.

Rotary Mower

A center mounted rotary mower for Ford and Ferguson tractors, Wood's Model 62 has been announced by the



Rotary Mower

Wood Brothers Mfg. Co.

Equipped with twin blades that cut a full 5 ft. swath, the machine is especially designed for high speed, large area mowing with the right side of the mower extending beyond the wheel, creating a "see where you mow" effect. Access holes in the deck plate allow the free swinging blades to be changed in a matter of minutes without getting under the mower.

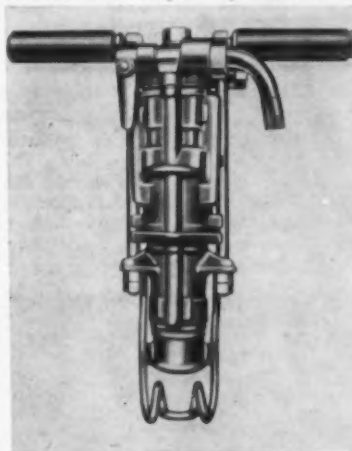
Wood Brothers Mfg. Co., Oregon, Ill.

For more details circle 117 on Enclosed Return Postal Card.

Rock Drill

A new 45 lb. class light-duty rock drill has been announced by Davey Compressor Co., Kent, Ohio.

Designated as Model S-30, it is said to provide high drilling performance and low maintenance. The drill can be used for both primary and second-



Rock Drill

ary blast holes, and with an air leg if desired. Available in three types: blower, blast, and wet, it has a three way throttle control. A patented lubrication system assures automatic oiling of every working part, the manufacturer states.

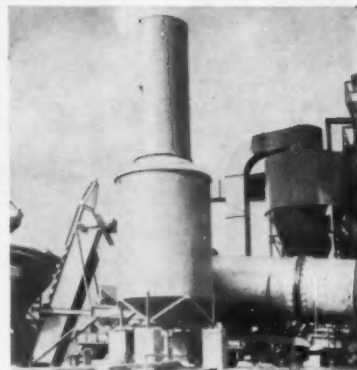
Davey Compressor Co., Kent, Ohio.

For more details circle 118 on Enclosed Return Postal Card.

Exhaust Washer

A newly engineered exhaust washer designed for efficiently controlling removal of dust caused by aggregate drying operations with asphalt plants has been announced by the Iowa Mfg. Co.

Available in three sizes with capacity ranging from 15,000 CFM to 45,000 CFM, Models 72-W, 96-W and 120-W Cedarapids exhaust washers reduce the dust nuisance for personnel, protect moving parts and reduce maintenance of motors and other equipment often damaged by fine dust and filtration. It also satisfies county and municipal regulations concerning pollution. Some of the features contained in these wash-



Exhaust Washer

ers are: welded steel construction; self contained support legs; protective coating on all inner surfaces; self-cleaning steel nozzles; and easy set-up.

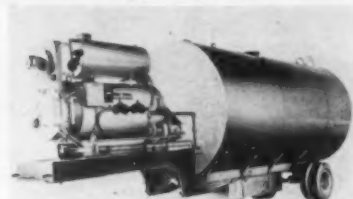
Iowa Mfg. Co., Cedar Rapids, Iowa.

For more details circle 119 on Enclosed Return Postal Card.

Compaction Chamber Heater

The Miller Spreader Corp. has introduced a new compaction chamber heater.

The new heater unit mounts on the rear chassis of the MC-500 Curbuilder and the element attaches to the compaction chamber housing, permitting faster warm-up and a smoother flow of



Compaction Chamber Heater

compaction. The element can be moved right or left to work on either side. It is easily removed for use on other jobs, such as pre-heating asphalt curb forms, curb finishing or for heating other asphalt tools.

Miller Spreader Corp., 4020 Simon Road, Youngstown, Ohio, Dept. CH-550.

For more details circle 120 on Enclosed Return Postal Card.

Motor Graders

Introduction of the No. 112 Series F, Motor Grader amounts to the addition



Cat Motor Grader

New Products

of a fourth machine to the company's motor grader line.

The new 112F is powered by a turbo-charged, four cylinder diesel engine of compact design which is rated at 100 hp. Horsepower of the No. 112 Series E has been increased to 85 and the No. 12E is rated at 115 hp. Both the No. 112E and No. 112F incorporated the Caterpillar oil clutch, improved blade controls, a one-piece transmission and final drive case, and the recently developed dry-type air cleaner.

Caterpillar Tractor Co., Peoria, Illinois.

For more details circle 121 on Enclosed Return Postal Card.

Pre-Finished Sign Wood

A new development by Kimberly-Clark is being used in the production of a pre-finished sign type plywood.

Called Kimpreg 8000, the plastic impregnated material, which comes in green and white, may be laminated to one or both sides of a sheet of plywood. The result is a plastic surfaced



Kimpreg 8000

plywood that requires no further finishing. The manufacturer claims that because of high resistance to weather, abrasion and chemicals, plywood surfaced with this material is especially recommended for highway and commercial signs.

Kimberly-Clark Corp., Neenah, Wis.

For more details circle 122 on Enclosed Return Postal Card.

Concrete Vibrator

The Maginniss Hi-lectric concrete vibrator is now available with a 1 1/4 in. diam. head for use on precast concrete columns, beams, and pipe, as well as prestressed work.

The manufacturer emphasizes that the motor used in this new "pencil" vibrator is outstanding for its power and rugged construction; there are no brushes or commutators to wear and require maintenance. Other features include a built-in cooling fan, replaceable air filter, and a duplex-type handle for easy operation in vertical or horizontal position. The reinforced flexible shafts are available in 5 ft., 10 ft., 15 ft., and 20 ft. lengths. The manufacturer



Pencil Vibrator

states that three 10 ft. lengths of shaft may be coupled together without loss of vibrating performance.

Maginniss Power Tool Co., Mansfield, Ohio.

For more details circle 123 on Enclosed Return Postal Card.

Paving Breakers

Development of two new low-vibration paving breakers has been reported by Atlas Copco.

The manufacturer states that the design permits use of the breakers on all types of demolition work, including concrete, asphalt and brick walls. They may also be used as trench diggers and



Copco Paving Breaker

the larger of the two machines can be converted for use as a sheeting driver. The machines, states the manufacturer, are applicable to all types of underwater construction, demolition and salvage operations. The machine may also be used on the horizontal.

Atlas Copco, 545 Fifth Ave., New York, N. Y.

For more details circle 124 on Enclosed Return Postal Card.

School Sign Unit

The new School Sign Unit, by Standard Signs, Inc., features a rugged 3/4 in. by 3/4 in. by 1/2 in. angle iron framework and ease of folding.

The overall width of the unit is 18 3/4 in. It is equipped with a simple device for locking it in the open position. The black on yellow "School" sign at top is available in either a baked enamel or



School Sign Unit

fluorescent finish. The black on white "Speed Limit" sign measures 18 in. by 24 in. and is finished in baked enamel. The signs may be single or double faced.

Standard Signs, Inc., 3190 E. 65th St., Cleveland 27, Ohio.

For more details circle 125 on Enclosed Return Postal Card.

Electric Plant

A new 2 kw electric plant powered by a Kohler K241 air-cooled engine has been announced by the Kohler Co.

Lightweight and compact, it is equipped with a 5.6 hp engine that will handle intermittent overloads up to 2.5



Electric Plant

kw. The single-phase generator supplies 60 cycle AC current at 115 or 115-230 volts. Vibro mounts, skid type base, fuel pump and mufflers are standard equipment. Other accessories will be offered, the manufacturer states.

Kohler Co., Kohler, Wisconsin

For more details circle 126 on Enclosed Return Postal Card.

Crawler Crane-Excavator

A new, fully convertible crane-excavator has been introduced by Bucyrus-Erie Co.

As a crane, it is rated up to 9-ton capacity and is available with booms from 25 to 80 ft. and boom-jib combinations up to 85 ft. As a hoe or shovel, it can be equipped with $\frac{1}{2}$ or $\frac{5}{8}$ yd. dippers; as a dragline-clamshell, it handles buckets ranging up to $\frac{3}{4}$ yd. capacities. Designated the 14-B, it has an improved ball bearing swing circle, adjusted



Crane Excavator 14-B

in the factory, prelubed and sealed, and is equipped with a two-section, hi-vision cab to provide ample room for operator and conveniently grouped controls. Other features include independent boom hoist, a choice of the type of power and gear box, and high altitude engines.

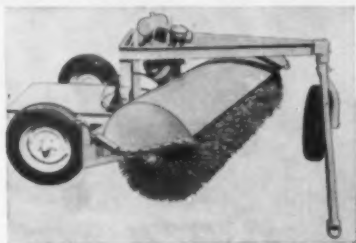
Bucyrus-Erie Co., South Milwaukee, Wis.

For more details circle 127 on
Enclosed Return Postal Card.

Road Sweeper

A newly designed road sweeper has been introduced by Little Giant Co.

Designated the Road Bird, it can be used with truck or tractor to serve as either a push-type or tow-type sweeper. The front mounted brush assembly of 6, 7, or 8 ft. and 7-4 or 11.5 hp Wisconsin engine is easily attached or detached as a unit by removing one pin, states the manufacturer.



Little Giant Sweeper

The brush angles go deg. right or left and can be reversed for even wear. Brushes are made of palmyra fibre; steel brushes are also available.

Little Giant Products, Inc., 1595 N.E. Adams St., Peoria, Ill.

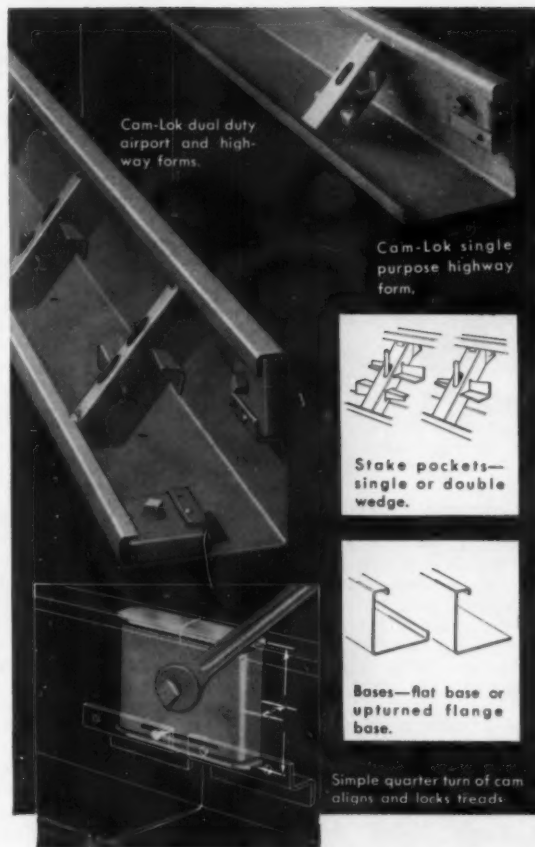
For more details circle 128 on
Enclosed Return Postal Card.

Digital Calculator

Calibrated for accuracy, printed in red, black and white, this pocket size calculator, by Bolind, Inc., will solve multiplication and division problems, reciprocals and proportions, square and square roots, cube and cube roots, circumference and area. Also included are conversion tables, for metric, horsepower, kilowatt, liter, Btu, joules and area computing.

Bolind Inc., Boulder 15, Colorado.

For more details circle 129 on
Enclosed Return Postal Card.



HELTZEL

CAM-LOK FORMS SPEED HIGHWAY, AIRPORT CONSTRUCTION...

Heltzel Single and Dual Duty Cam-Lok airport and highway forms make form setting faster, easier.

With superior Heltzel cam-locking design sledging is unnecessary. A simple quarter turn of the cam draws treads and faces of both form sections into alignment—secure against vertical and horizontal thrusts under machine weights. Heavy Helcoloy $\frac{1}{4}$ " steel-plate construction assures rigidity and long life.

Each Dual Duty Form is actually two form sizes in one—each can be used for two different slab thicknesses. One or two sizes may well handle all your paving form requirements.

Take advantage of Heltzel's specialized engineering facilities to help solve your equipment problems. Write for free Bulletins 59-3 and 59-12, or contact your nearby Heltzel distributor.



THE HELTZEL STEEL FORM & IRON CO.
Warren, Ohio

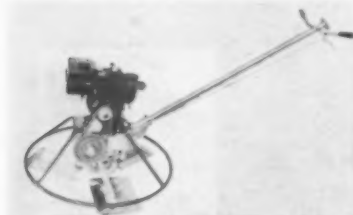
... for more details circle 353 on enclosed return postal card

New Products

Finisher

A concrete troweling machine in a 29 in. fixed guard ring size powered by a 3 hp. Briggs-Stratton engine is now available from the Champion Mfg. Co.

The unit, designated Model 290-G,



Champion Troweling Machine

features a positive action clutch, a dead man's grip that stops trowel rotation when released, and bronze gears. Equipped with three combination float-finish trowel blades, the device is adaptable for use with grinding stones.

Champion Mfg. Co., 3700 Forest Park Ave., St. Louis 8, Mo.

For more details circle 130 on Enclosed Return Postal Card.

Four-Channel Radio

A four-channel Citizen's Band radio for highly flexible communications

ashore or afloat has been announced by the Radio Corporation of America.

The RCA radio-phone Mark VII is designed to operate in the citizen's band of frequencies set aside by the FCC for use by the general public. Measuring 5 by 12 by 8 in., it features four crystal-controlled channels for transmitting and receiving, as well as a tunable receiver covering all 23 channels in that range. Designed to fit under the dashboard of any vehicle, it is equipped with a push-to-talk microphone allowing the user to keep one hand free to grip the wheel.

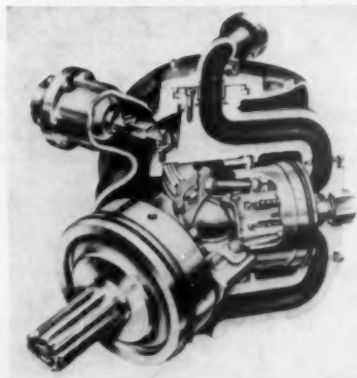
Radio Corp. of America, 30 Rockefeller Plaza, New York, N. Y.

For more details circle 131 on Enclosed Return Postal Card.

Hydrostatic Transmissions

A working model of the Dowmatic Hydrostatic power transmission was put on display last June at the New York Coliseum. This was the introduction to the American market by the Dowty Group Limited of England.

Now in use throughout England in a number of road-building vehicles, tractors and diesel locomotives, the transmission is designed primarily for vehicles engaged in heavy work requiring continual use of low gears and high maneuverability. Some advantages are single lever control from full forward to full reverse, a stepless transmission, elimination of mechanical



Hydrostatic Transmission

drive line, gear shifts and reverse mechanisms, and elimination of wheel brakes.

Dowty Group Limited, Arle Court, Cheltenham, Glos., England.

For more details circle 132 on Enclosed Return Postal Card.

Diesel Engine

General Motors Series 371 diesel engines are now available as optional equipment on several heavy-duty Clarklift fork trucks, according to Clark Equipment Co.

GM's Model 3057C is a two-cycle, three-cylinder engine with a total displacement of 212.8 cu. in. and a rated bhp. of 118 at 2300 rpm. Model 4057C

INGRAM

IN ACTION





INGRAM 12 ton 3-wheel roller rolls hot coarse grade asphalt directly behind bituminous paver on North Loop 13, San Antonio, Texas.

INGRAM 8-12 ton tandem roller works in background.

Both rollers feature REVERS-O-MATIC Drive.



Acme
IRON WORKS

CULEBRA AVE. AT EXPRESSWAY N. W.
P.O. BOX 2020 • SAN ANTONIO 6, TEXAS

AVAILABLE IN ALL SIZES

... for more details circle 276 on enclosed return postal card

is a two cycle, four-cylinder engine with a total displacement of 283.7 cu. in. and rated bhp. of 167. On CY 350 and CY 400 trucks of 35,000 and 40,000 lb. capacities, GM's model 4057C engine is available for application requiring higher horsepower than the 3057C engine.

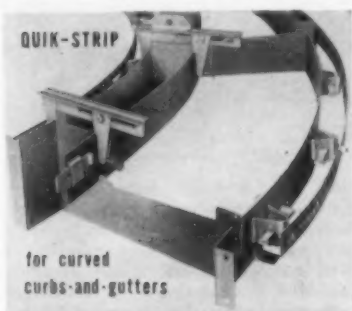
Clark Equipment Co., Construction Equipment Co., Benton Harbor, Mich.

For more details circle 133 on Enclosed Return Postal Card.

Flexible Steel Forms

A new flexible steel form that simplifies pouring for curb and gutter combinations in curves has been announced by Binghamton Metal Forms, Inc.

In two steps the form, known as



Curb and Gutter Forms

Quick-Strip, can be set up and locked in place to form uniform curved facings. To strip off, the clamps are unscrewed and the form lifted off the curbing. Lengths of 10 ft. and heights from 6 in. to 9 in. are available.

Binghamton Metal Forms, Inc., Binghamton, N. Y.

For more details circle 134 on Enclosed Return Postal Card.

Bridle Hitch Clamp

A new fitting which provides a quick way of attaching a load to a bridle cable was announced by Sauerman Bros., Inc.



Bridle Hitch Clamp

The wedge type clamp holds the load securely on the bridle. Its saddle groove is a bearing for the bridle cable and provides a smooth transfer of the transverse load. It has a device for attaching a wire rope block or other load. The three-part fitting consists of a wedge clamp, wedge, and cable clip. The device is available in sizes for 3/4 in. or 1 in. wire rope.

Sauerman Bros., Inc., 620 S. 28th St., Bellwood, Illinois

For more details circle 135 on Enclosed Return Postal Card.

Trowling Machine

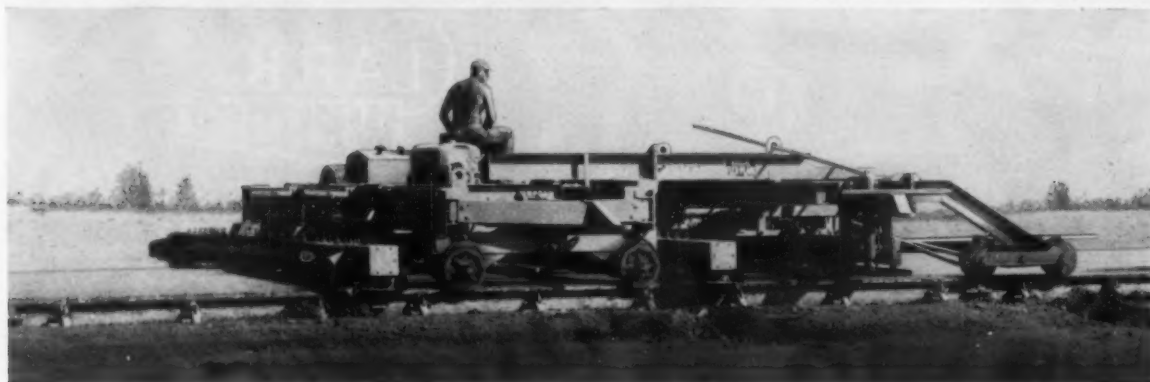
A new large size rotary trowling machine, which was designed for large areas, has been announced by Stow Mfg. Co.

Entitled the G 46B, the device trowls 11 sq. ft. of surface per revolution, ac-



Trowling Machine

NEW FLEX-PLANE FINISHER FLOAT



Separate traction, screed drives for faster, finer finishing

The Flex-Plane Combination Finisher-Float Machine combines faster, smoother finishing at less cost with true over-the-road mobility.

The DC gas-electric drives, with infinite speed ranges (0 to maximum), power separate traction and screed drives. Operator can select desired ratio of screed speed to machine speed to compensate for any degree of slump. Each can be operated independent of the other. Finishing and floating become one operation with one operator—minimizes hand finishing. Float

section may be detached, permitting variable width finisher (12' to 26') to be used independently.

Built-in highway transport wheels (optional) on both finisher and float units are controlled hydraulically from central control panel of finisher section, allowing each unit to be towed from job to job quickly, easily.

Write today for free Bulletin 59-5, or contact your nearby Heltzel distributor.



THE HELTZEL STEEL FORM & IRON COMPANY

Flex-Plane Division • Warren, Ohio



... for more details circle 352 on enclosed return postal card

New Products

cording to the manufacturer. Equipped with a double handle for extra support, the unit comes with float and finish blades as standard equipment. The four blades are guarded by a stationary guard ring and a "dead man" control clutch adds a feature of safety. The 6.8 hp engine allows the trowling speed to be varied from 25 to 100 rpm.

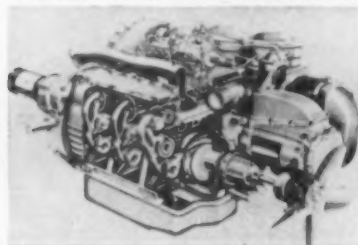
Stow Mfg. Co., 443 State St., Binghamton, N. Y.

For more details circle 136 on Enclosed Return Postal Card.

Vari-Fuel Engine

A new engine which runs on high or low test gasoline, diesel oil, kerosene, jet fuels or cleaning fluid was introduced in the U. S. by England's Rootes Motors.

Suitable for use in cars, trucks, buses,



Vari-Fuel Engine

tractors or construction machinery, the engine is a two cycle, three cylinder unit designed to deliver 105 bhp. The multi-fuel feature depends on a special type of variable pressure fuel injection system which varies the amount of fuel fed into the combustion chamber depending on the fuel being used.

Rootes Motors, Inc., 42-32 21st Street, Long Island City, N. Y.

For more details circle 137 on Enclosed Return Postal Card.

Wheeled Tractors

A new series of wheeled industrial tractors was announced by the Minneapolis-Moline Co.

Powered by a 206 cu. in. Moline-build engine, the Big Mo 500 develops 56 bhp. on gas and 50 bhp on diesel fuel. The 600 series develops 60 bhp on gas. Both units have heavy-duty axles and frames allowing them to



Wheeled Tractors

handle various types of heavy equipment. Five speeds forward on both rigs range from 2.63 to 14.57 mph. and five speeds reverse ranging from 3.29 to 18.22 mph.

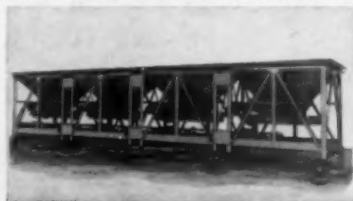
Minneapolis-Moline Co., Hopkins, Minn.

For more details circle 138 on Enclosed Return Postal Card.

Aggregate Feeders

A new aggregate feeder built for continuous or batch mixing has been announced by Barber-Greene.

Each model 817 bin is a complete bin which permits combinations of two, three, four or more bin extensions, in

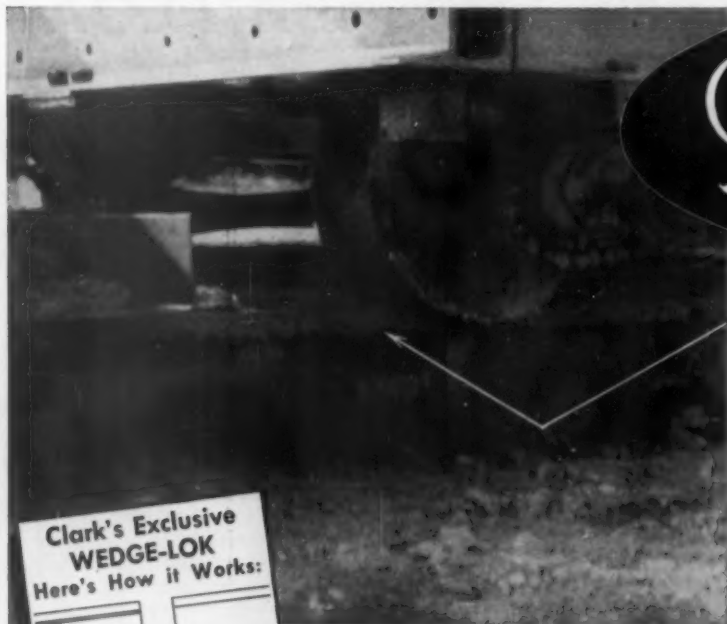


Cold Aggregate Feeder

two, four and six foot increments. Each bin is equipped with a Barber-Greene belt feeder and when used in any combination of any number of bins the total control of the aggregate feed may be achieved.

Barber-Greene Co., Aurora, Illinois

For more details circle 139 on Enclosed Return Postal Card.



UNRETOUCHED PHOTO

CLARK
WEDGE-LOK
PAVING FORMS

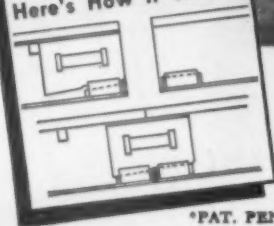


**No deflection
at the joint
during load transfer**

**NOW! form setting time
reduced to a minimum with
Clark Wedge-Lok* the exclu-
sive method of form joint.**

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DIVISION OF CLARK GRAVE VAULT CO.

... for more details circle 293 on enclosed return postal card

Batter Washer

A reusable Richmond Batter Washer, designed to hold a Tylag at an angle up to 45 deg. without welding, has been introduced by the Richmond Screw Anchor Co., Inc.

This is made possible by a slot in the haunch at the top of the batter



Batter Washer

washer which allows the Tylag to swing freely to the desired angle. The manufacturer states that the product is well suited for Ty-down forms, battered walls, pier nose forms and abutment corners.

Richmond Screw Anchor Co., Inc., 816-838 Liberty Ave., Brooklyn 8, N. Y.

For more details circle 140 on Enclosed Return Postal Card.

Siren/PA System

A combination electronic siren, public address system and radio amplifier has been introduced by Dazl-lite Products Co.

The installation consists of two parts, the control panel and microphone; and the speaker unit. Control is provided by a selector switch which per-



Siren/PA System

mits automatic or manual siren operation. The unit's warble pitch for storm warnings and a distinctive tone for air-raid signals are said to eliminate confusion and make each vehicle an auxiliary mobile warning unit. The manufacturer reports that the units will not clog or freeze in adverse weather conditions.

Dazl-Lite Products Co., 17 E. Pershing Road, Kansas City, Mo.

For more details circle 141 on Enclosed Return Postal Card.

Seal Spray Gun

A new tool for the application of membrane waterproofing systems has been announced by Flintkote.

Designated the Sealzit Gun, it is used to apply asphalt or other materials. It can be used in the application of side-walls or insulation; for maintenance and repair, sound deadening and pipe



Sealzit Gun

coating; and as a corrosive protection in water tanks and in waterproofing irrigation ditches. The gun applies an especially formulated emulsion with a continuous flow of chopped fibers which may be combined with a number of aggregates including crushed rock, sand or metallic powders.

Flintkote Co., 30 Rockefeller Plaza, New York 20, N. Y.

For more details circle 142 on Enclosed Return Postal Card.



MAGINNISS POWR-FACTORS

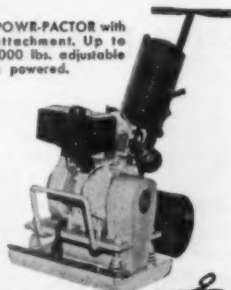
patch asphalt faster!

Maginniss vibratory compactors speed placing and patching of blacktop . . . are easily moved from job to job . . . work fast, at speeds up to 50 ft. per minute. Water feed prevents asphalt adhesion . . . assures smooth finish.

Put Maginniss Powr-Factors to work on your blacktop jobs. The increased production, lower costs and small initial investment will surprise you. Call your Maginniss distributor today! Maginniss Power Tool Company, 154 Distl Avenue, Mansfield, Ohio.

AA-7021

MODEL PP-18 POWR-FACTOR with water feed attachment. Up to 7,000 vpm, 4,000 lbs. adjustable force, gasoline powered.



Maginniss Power Tool Company Dept. RS-70
154 Distl Ave., Mansfield, Ohio

Yes, I want to know more about the Powr-Factor for asphalt work.

name _____
address _____
city _____ zone _____ state _____

... for more details circle 330 on enclosed return postal card

New SPEEDLINE ROAD PLANER

Automatic "Traverse Leveling Action" spreads sub-base materials to uniform thickness without segregation or corrugation. Patented "Spring Equalization" exclusive with Speedline. Approved by Engineers and Contractors for road building. Also ideal for leveling parking lots, air field strips, housing areas, farmlands.

For the finishing touch

Look to SPEEDLINE



Model C 126 DI Scrape-A-Plane

Write for details:

... for more details circle 340 on enclosed return postal card

ROADS AND STREETS, July, 1960

SPEEDLINE IMPLEMENT MFG. CO. Las Cruces, New Mexico



Low silhouette (2:12 roof slope) Armco building of rigid-frame type is featured with Steelox paneling and masonry.



Single slope roof construction is used in this office building variation made from Armco's steel building components.



Interior view shows new insulated finishing panels. Panels come complete with base trim, ceiling trim and finishing pieces for around doors and windows.

Armco Engineers New Steel Building Line

A completely new line of pre-engineered steel buildings has been introduced by Armco Drainage & Metal Products, Inc. Clear-span widths range from 5' 4" up to 120 ft.; sidewalls up to 40 ft. In addition, there is a whole new series of buildings with a single slope roof and in widths up to 24 ft.

A new choice of roof slopes is offered in the self-framing and rigid-frame buildings from 8 ft. to 120 ft. wide. Buyers have an option between the new low silhouette roof (2:12 pitch) or the more

traditional 4:12 pitch.

Another feature is described as a "revolutionary roof structure"—a continuous beam-type purlin system in the roof of rigid-frame and truss-type buildings. Roof framework is lighter and more rigid. Purlins are above the rafters, out of the way of wiring, sprinklers, ductwork, insulation and other equipment.

One feature is a sculptured Steelox curtain-wall panel that provides an attractive shadow effect. Another innovation is a special new indus-

trial interior wall panel designed to the same 16-in. module as the exterior Steelox panels. These liner panels are ready to snap in place and are moisture-proof.

Through local dealers, Armco offers a complete building service that starts from planning to erecting and finishing. Financing is also available — making it possible to spread up to 80 percent of the total cost over a 5-year period.

For more details circle 144 on Enclosed Return Postal Card.

Michigan Tractor Dozer

A number of design changes in the Michigan Model 180 tractor dozer have been announced by the Construction Machinery Div. of Clark.

A new blade containing a built-in push plate permits the unit to be used as a dozer or pusher without exchanging dozer blade for push block. The



Michigan Model 180

blade has a maximum digging depth of 2 ft. 3 in. Two large double-acting hydraulic cylinders have been added to the dozer blade push arms. These are controlled with a single lever permitting the operator to tilt the blade while in motion. A lengthened wheelbase of 12 in. and two double-acting hydraulic cylinders used to steer the rig are also feature changes.

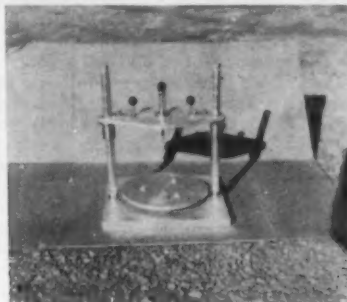
Clark Equipment Co., Construction Machinery Co., Benton Harbor, Mich.

For more details circle 145 on Enclosed Return Postal Card.

Core Measuring Device

A core length measuring device for accurately determining the height of drilled concrete cores is now being manufactured by Hogentogler & Co.

The manufacturer reports that this device is the type developed by the U. S. Bureau of Public Roads, and conforms to the requirements of ASTM



Core Measuring Device

C-174. It can be used for cores 4 and 6 in. in diameter and 4 to 10 in. long. It consists of a base with rotating specimen table, a rigid frame which can be adjusted at definite known heights above the specimen and a graduated rod to measure the height at nine different positions.

Hogentogler & Co., 5218 River Road, Washington, D.C.

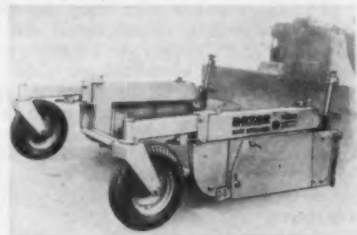
For more details circle 146 on Enclosed Return Postal Card.

Dozer Base Spreader

A high-production Dozer Base Spreader with adjustable hopper and spreading width was recently introduced by Ulrich Mfg. Co.

Designated the Model 18, the new spreader is designed so that one unit can be used, without modification, on any bulldozer-equipped Caterpillar machine.

Fully adjustable members and a sim-



Dozer Base Spreader

plified mounting arrangement give the machine a variety of hopper widths. Through use of a screw-jack, crossmembers can be adjusted in a few minutes to fit specified spreading jobs from 8 to 18 ft. The entire spreader mounts directly on the tractor's dozer blade through the use of large threaded clamps. Under ideal conditions, the machine has a capacity of 600 yds. per hour.

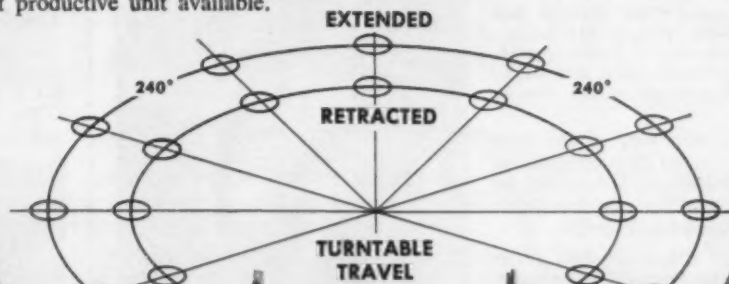
Ulrich Mfg. Co., Roanoke, Ill.

For more details circle 147 on Enclosed Return Postal Card.

FOR A MAN-SIZED DRILLING JOB WILLIAMS AUGERS!

No longer is it necessary to send a boy to do a man-sized drilling job. Williams equipment has grown with the caisson foundation business and no job is too large.

Equipped with turntable base for quick spotting, outrigger jacks for easy levelling, power crowd for rapid penetration, trunnioned derrick for batter drilling, service hoist for tools and casing handling, the Williams earth boring machine is the most productive unit available.



MODEL LDH

Williams Digger capable of drilling holes to 55 feet deep with diameters to 96 inches under ideal conditions.



Manufactured by
HUGH B. WILLIAMS MFG. CO.

8330 Lovett Ave.

P. O. Box 7815 • Dallas, Texas

Write Exclusive Distributor

JOSLYN MFG. & SUPPLY CO.

2101 Corinth St. • Dallas, Texas
for DESCRIPTIVE LITERATURE

New Products

Welding Aids

A new welding aid for engineers, designers and shop men, that quickly specifies correct filler alloys for all recommended wrought alloy parent metal combinations, was announced by Aluminum Company of America.

The chart makes filler alloy choices possible based on parent metal combinations and common service requirements demanded of welded assemblies. Acceptable filler metal alloys are listed for each combination and given a rating for each of the following service requirements: service durability at given temperatures; ease of welding; strength of welded joint; and corrosion resistance.

Aluminum Company of America,
1501 Alcoa Bldg., Pittsburgh 19, Pa.
For more details circle 148 on
Enclosed Return Postal Card.

Tamping Roller

A new self-propelled sheepsfoot tamping roller has been announced by Bros Inc.

Designed to speed consolidation of materials on large earthfills the new machine, the SP-gDT, has an uninterrupted rolling width of 15 ft. 9 in. Speeds from 1.5 mph to 7 mph in both forward and reverse, which eliminates



Self-Propelled Tamping Roller

turn-arounds at the end of a course. The roller's three drums are driven by a 150 hp diesel engine. Each drum is 5 ft. in diameter and 5 ft. wide. Worn tips of tamping feet are replaceable. The weight per foot of drum is 4,700 lb. when the drum is empty. The rig is 29 ft. 6 in. long, 17 ft. 10 in. wide and 11 ft. 6 in. high. The driver's seat is located to provide full visibility on all sides.

Bros Inc., Road Machinery Div.,
1057 Tenth Ave., S. E., Minn. Minn.

For more details circle 149 on
Enclosed Return Postal Card.

Crawler

A newly designed tractor-type crawler that will travel distance has been developed by Link-Belt Speeder Corp.

Manufactured to accompany the LS-78 ¾ yd. shovel-crane, the rig features a track belt with full grouser shoes, a compensating arrangement that automatically relieves excessive track tension caused by obstacles wedging



Tractor-type Crawler

between the track rail and idler wheel, and a completely sealed carbody that protects all components of the traction and power steer mechanism while traveling through deep water or muck.

Link-Belt Speeder Corp., 1201 Sixth
Street S. W., Cedar Rapids, Iowa.

For more details circle 150 on
Enclosed Return Postal Card.

Liquid De-Icer

A new liquid chemical road de-icer has been announced by the Royce Chemical Co.

Called Liquid Sun, this product can be distributed from a spray on the back of a truck. According to the manufacturer, the product will cause a minimum corrosive action to streets and highways. The chemical will continue to be an effective melting agent at temperatures as low as 0 deg. It is suggested that costs may be cut by the fact that time is being saved in application and through the use of trucks that would otherwise be standing idle during the snow season.

Royce Chemical Co., Carlton Hill,
N. J.

For more details circle 151 on
Enclosed Return Postal Card.

Jay Tamper maintenance: "2 years - \$17"

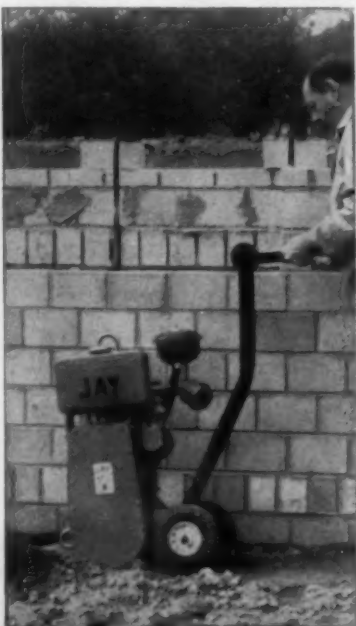
The Roy Klossner Company, San Antonio, Texas, sells Jay Tampers to such blue ribbon contractors as the Bechtel Corporation, which used 7 of them on the Reynolds Aluminum project near Gregory, Texas.

Reports Klossner: "The first 50 Jay Tampers we sold averaged \$17 for replacement parts over a 2-year period. Double that to count labor, and maintenance still figures out at less than 4c per hour."

Savings on such jobs as the Port Charlotte Residential Development and the Tidewater Refinery are similar. In one case, compaction cost per cubic yard was cut from \$2.68 to 12c.

Even greater savings are now available with Jay's new models, which tamp harder, faster, better on all soils and blacktop. Improvements include stepped-up power, new handles, and a new trailer for easy transport.

See your Jay dealer for a free demonstration, or send for new Catalog J-0. Jay Company, Division of J. Leukart Machine Co., Inc., 2228 South Third Street, Columbus 7, Ohio.



JAY tampers

... for more details circle 322 on enclosed return postal card

Tandem Roller

A new Essick Model 120, one ton tandem roller has been announced by Essick Mfg. Co.

The new roller is lifetime lubricated and has a fully exposed engine and



Tandem Roller

transmission to provide for bench servicing. With a maximum working weight of 2070 lbs., it is available in 14 models ranging from ½ to 14 tons.

Essick Mfg. Co., 1950 Santa Fe Ave.,
Los Angeles 21, Calif.

For more details circle 152 on
Enclosed Return Postal Card.

Truck Performance Scale

A new slide rule that mathematically measures truck performance in a few seconds has been developed by White Motor Co.

The precision instrument eliminates extensive paper work in determining such information as: horsepower required for a given performance; gross weight possible with a given engine; grade performance; optimum speeds; speed in consideration of tire sizes and loads; axles ratios; and rpm for a known road speed. Complete operating directions, plus tables on tire rpm, air resistance hp, and altitude with many other factors is also included.

White Motor Co., 842 E. 79th St., Cleveland 1, Ohio.

For more details circle 153 on Enclosed Return Postal Card.

Crane-Excavator

A new air-controlled crane-excavator in the $3\frac{1}{2}$ to $4\frac{1}{2}$ cu. yd. size has been announced by American Hoist & Derrick Co.

The new machine, when rigged as a lifting crane, has the capacity of 110 tons. Several types of booms are available and all are alloy steel with tubular



Crane-Excavator

lattice construction and pin connecting sections. The traction chains are mounted outside the crawler side frames for easy access. This feature also permits removal of the side frames without breaking the traction chain.

American Hoist & Derrick Co., St. Paul 7, Minn.

For more details circle 154 on Enclosed Return Postal Card.

Pole Trailer

To eliminate idle and seldom-used equipment, the Atlas Trailer Mfg. Corp. has developed a multipurpose extensible trailer which combines into one unit the features and functions of two trailers, a pole trailer and platform trailer.

The new combination platform-pole trailer, known as the Atlas Extendable,

is basically a platform trailer for the normal hauling of flat loads. However, the extendable trailer is easily adjustable to a full length pole trailer of 55 ft. Intermediate settings of 5 ft. spacing are also provided, which range from the basic length of 35 ft. to 55 ft. lengths.

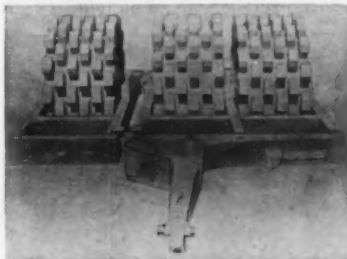
Atlas Trailer Mfg. Corp., 390 Tonelle Ave., Jersey City 6, N. J.

For more details circle 155 on Enclosed Return Postal Card.

Grid Rollers

A third wheel that can be attached to a Hyster Model D tamping and grid roller to increase compaction width was announced by Hyster.

The standard Model D consists of two wheels, each 32 in. wide, and within its own frame. The new attachment contains another such wheel in a sepa-



Additional Compaction Wheel

rate frame and hinges to the side of the basic unit. The addition will increase compaction width from six to ten ft. The roller tongue is relocated on a special bracket, placing it on the center of the frame for towing. It may be quickly converted back to its original width by removing the hinge pins and rebolting the tongue in its original position.

Hyster Company, 2902 N. E. Clarkamas St., Portland 8, Ore.

For more details circle 156 on Enclosed Return Postal Card.

Bituminous Spray Master

A new asphalt sprayer has been announced by Littleford Bros., Inc.

All operations of the new machine are controlled by one handwheel. A dial may be set to give the rate of application, from .075 to 3.0 gal. per sq. yd. The bar is adjusted from a meter on the operator's control panel. According to the manufacturer small quantities of material may be heated. A full circulating spray bar provides even



Spray Master

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Send today for complete specifications
and technical data sheets on the following:

● **FLINTSEAL JFR*** (Hot poured)
A one-component, rubber-tar thermoplastic compound to be melted and poured. Cools quickly, retains tough, elastic bond in pavement joints and cracks through cycles of expansion and contraction. Fed. Spec. SS-S-167b.

● **FLINTKOTE M-200** (Cold-Applied)
Two-component, polymer type sealer. Sets quickly, resists aircraft fuel, heat and blast from jets. Bonds perfectly to concrete and remains ductile at minus 20°F. Interim Fed. Spec. SS-S-00200a and pertinent Purchase Descriptions, as modified.

● Also ask about exciting new Flinteret[†]—Flintkote's polysulfide/epoxy concrete bonding compound for pavement restoration and repair.
● And Flintar[®]/coal tar pitch emulsion. Fed. Spec. R-P-00355a for sealcoating bituminous pavements. Write: The Flintkote Company, P. O. Box 157, Whippany, New Jersey.

*Reg. U.S. Pat. Off. †T.M. of The Flintkote Company



Manufacturer of diversified products for home and industry

... for more details circle 300 on enclosed return postal card

New Products

starts and instant shutoff without dripping, the manufacturer states.

Littleford Bros., Inc., Public Relations Dept., 453 E. Pearl St., Cincinnati 2, Ohio

For more details circle 157 on Enclosed Return Postal Card.

Temporary Guard Rail

A new all steel guard rail stanchion has been developed by Superior Scaffold Co.

Providing an even rail height of 42 in., the new stanchion may serve



Superior Guard Rail

as a temporary guard rail around the perimeter of bridges and requires no tools for installation. Heavy threads and handles provide a positive clamping action which will affix to a slab from 4 to 20 in. thick. All components of the stanchion are said to be 100 percent salvageable.

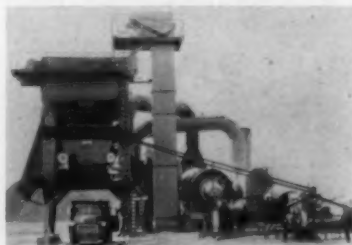
Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Calif.

For more details circle 158 on Enclosed Return Postal Card.

Asphalt Plant

An 8000 lb. batch capacity asphalt plant is now available from Standard Steel Corp.

The new model designated the R-M is designed and built to provide dependable service, ease of operation and large capacity, according to the manufacturer. Equipped with a Super-lift dryer, the entire dryer is a self-contained package with an individual gear-



Asphalt Plant

motor power. The curved surface is lined with one inch cast alloy sectional wear resistant liners.

Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles, Calif.

For more details circle 159 on Enclosed Return Postal Card.

Truck-Mounted Crane

A fully-hydraulic, truck-mounted crane with a 16 ft. reach and a 3,750 lb. capacity has been announced by Teal & Co.

The "200", as it has been designated, uses simple design and the latest alloy steels to produce maximum lift with minimum weight, according to the manufacturer. The 16 ft. boom works in a full 360 deg. circle, lifts from 2,500 lb. to 3,750 lb. and dual controls facilitate rapid and accurate "in-sight" control leads. Mounted 17 in. behind the cab, the rig leaves the balance of the truck bed free for other uses. Equipped with hydraulically extendible outriggers, load stability is increased. Also available is a hydraulically telescoping boom that can be extended or retracted from 16 ft. to 28 ft., under full load.

Teal & Co., P. O. Box 308, Omaha, Nebraska

For more details circle 160 on Enclosed Return Postal Card.

NEW Arrow Side-Action Hydraulic Hammer

The new Side-Action Arrow gives you all the money-saving, money-making features of the standard Arrow plus the benefits of side action. It works close to buildings, piers, abutments, footings, etc. It works a distance of 7 feet from side to side across the front of the machine—8 feet by angling the hammer leads.

The new Arrow has proved efficient and economical for a wide variety of jobs: Cutting asphalt, breaking concrete, tamping backfill and driving short piling. Finger tip hydraulic control provides rapid, exact positioning of the hammer. Hammer stroke control can be set on automatic to deliver blows of uniform impact at a uniform rate—or control can be manual.

The Arrow can be driven from job to job at speeds up to 30 miles per hour. Working speeds are possible up to 32 feet per minute, forward or reverse, through Arrow's hydraulically powered creeper gear (Patent No. 2,928,322).

One man operating an Arrow can do more work in less time—and do a better job—than an entire crew of men using conventional air tools.

For complete information about the new Arrow Side-Action Model and its money-making features, WRITE TODAY!



ARROW MANUFACTURING COMPANY

194 W. Dakota Ave., Denver 9, Colorado

... for more details circle 284 on enclosed return postal card

Storage-Heater Plant

A portable packaged unit that heats and stores bituminous and hot mix asphalt is now available from Cleaver-Brooks Co.

The unit is equipped with a choice of 10,000, 15,000, or 20,000 gal. asphalt storage tank and a Cleaver-Brooks Peak-Temp oil heater that quickly and efficiently boosts the temperature to



Storage-Heater Plant

450 deg. The unit is mounted on a single, sturdy frame and rolls on pneumatic tires—which eliminates the need for dismantling and reassembling. The manufacturer says that safety is made possible by using electric, electronic and pressure safety controls safely shutting down the heater in the event of flame failure, high pressure and temperature, low liquid or loss of oil.

Cleaver-Brooks Special Products, 225 N. Grand Ave., Waukesha, Wis.

For more details circle 161 on Enclosed Return Postal Card.

Optical Painter

Perfectured by Wald Engineers, the optical painter fits below the windshield of the striping machine cab. It is especially practical in confined city



Optical Painter

projects. The device allows the operator a choice of reference line such as the medial strip, edge line or center line.

Wald Industries, Inc., Huntingdon, Pa.

For more details circle 162 on Enclosed Return Postal Card.

Auxiliary Trailer Brakes

An auxiliary control for trailer brakes, manufactured by Midland-Ross Corp., provides a means of applying or releasing trailer brakes where the trailer has air pressure but is disconnected from the tractor.

With the auxiliary control parked trailers may be moved without having to couple the tractor-trailer air connections. When the emergency line is disconnected from the tractor, the trailer brakes can be released by pushing the dash valve handle. Brakes can be reapplied by pulling handle out. It has no effect on normal handling.

Midland-Ross Corp., Owosso Div., Owosso, Mich.

For more details circle 163 on Enclosed Return Postal Card.

Diesel Trucks

Two new six-wheel diesel trucks especially designed for heavy duty service over rough terrain and severe conditions have been announced by Mack Trucks, Inc.

Known as the B-61SE and B-613SE, these units are designed to provide an extra measure of durability and low



Mack's Six Wheeler

maintenance service under strenuous operating conditions, according to the manufacturer. The B-613SE is powered by a Mack turbocharged EMDT diesel engine which develops 205 hp. The B-61SE offers a similar engine which develops 170 hp.

Mack Trucks, Inc., Plainfield, N. J.

For more details circle 164 on Enclosed Return Postal Card.

Striping Machine

A street striping machine that will operate regardless of outside temperature was announced by Wald Industries.

This machine uses an automatic paint heater that provides constant viscosity control of the paint. This makes possible a uniform application and film thickness throughout the working day from one setting of the controls. Other features of the new machine include an optical pointer that eliminates the customary long, projecting guide; swivel spray guns; and a safety design that places the workmen in the cab and on the truck bed instead of precarious positions near the road. The machine places lines in two colors in single and multiple lines as well as edge lining. It straddles the center line and sprays out of front-mounted guns allowing traffic to pass on both sides.

Wald Industries, Huntingdon, Pa.

For more details circle 165 on Enclosed Return Postal Card.

Job Finished 3 Weeks

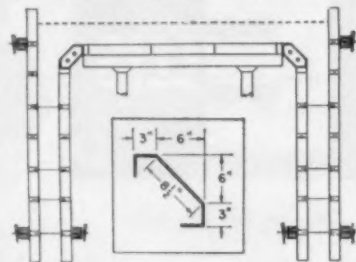


How to Pour a Tunnel in a Hurry...

Symons Culvert Forms The Answer

When awarded a contract to build a 340 ft. tunnel, Schweiger Construction Company, Kansas City, Mo., faced the problem of how to do it fast and as economically as possible.

Symons Culvert Forms solved the problem. They eliminated the need for any special form or job-built construction.



Schweiger used Symons 1" steel channel filler horizontally on top of 6' vertical panels on the inside of the walls. Culvert Forms were placed on top of this filler. The forms underneath were stripped with no difficulty and the fillers and culvert forms were then removed without disturbing the decking for the slab, which was left in place for an additional curing period. Walls and top slab were poured monolithically in three pours. Job was completed in three weeks.

Symons forms, shores and column clamps may be rented with purchase option. Additional information on Symons Culvert Forms is available upon request.

Symons
SYMONS CLAMP & MFG. CO.
 4283 Diversey Ave., Dept. G-0, Chicago 39, Ill.

MORE SAVINGS FROM SYMONS

... for more details circle 338 on enclosed return postal card

Horizontal Vibrating Screen

Horizontal vibrating screens, available in three new sizes, are now in production by Universal Screenmaster.

Available in 5 ft. x 12 ft., 5 ft. x 14 ft., and 5 ft. x 15 ft., these screens feature rubber bushed phrasing bar and air springs which completely eliminate leaf and coil springs. These are also available with 2 decks, 2½ decks and 3 decks.

Universal Engineering Corp., Cedar Rapids, Iowa

For more details circle 166 on Enclosed Return Postal Card.

Soil Lathe

A new soil lathe manufactured by



Motorized Soil Lathe

Soiltest, Inc. has been introduced to simplify trimming soil samples for test purposes.

Soils ranging from soft clays to friable pumices may only be trimmed roughly to size before they are mounted on 1.4 in. or 2.8 in. diam. grips, according to the manufacturer. The lathe's speed can be varied by a convenient control lever, and trimming speed of from 100 to 300 rpm are recommended with the unit. A wedge blade knife, an angle blade and wire saws for the trimming work are provided with the Model P-400. The operation is controlled by a foot switch.

Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

For more details circle 167 on Enclosed Return Postal Card.

ROTARY SWEEPER BROOMS

WE MANUFACTURE

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- Del-Harvester
- Fordson
- Pargason
- Grace
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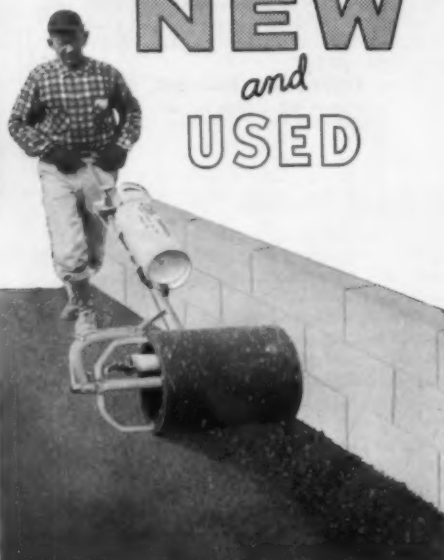
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and
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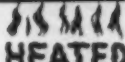
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- 1—3x8 Austin & Weston Apron Feeder, Model 86, with disengaging clutch assembly. Price, \$4,000.00.
- 1—8'x18' Howe Platform Truck Scale, equipped with Model 1700 Weight-O-Graph. Price, \$400.00.

CONCRETE PLANT EQUIP.

- 1—1600 Bbl. Heltzel Cement Plant, complete with Bin Valves, Batchers and Scales. Disassembled, good condition. Price, \$4,000.00.
- 1—600 Bbl. Heltzel Cement Plant. As above. Price, \$3,000.00.
- 1—1½ yd. Johnson Agg. Batchers, Model 168, complete with 3 compartment bin bottom, 3 quadrant gates, scale beams, levers & beam box. Good condition. Price, \$1,000.00.
- 2—Gründler Belt Elevators. One 52' Centers. One 58' Centers. Complete with drive belts, 25 American speed reducer, 20HP Motors, 26" belt, 24" material buckets. Rated cap., 100TPH. Condition good. Price, \$2,000.00.
- 1—26" x 8 Ply Elevator Belt, 136' long (new) 36 oz. for above elevators. Price, \$1,000.00.
- 1—Lot of new 26" Elevator Belt, 8 ply, 36 oz., various lengths, 20' - 40'. Price, \$5.00 per ft.
- 1—Lot of used 26" Elevator Belt, 8 ply, 36 oz., various lengths. Price, \$2.50 per ft. Also Misc. Repair parts for 26" Gründler Elevators. Gears, bearings, shafts, etc. New and Rebuilt. Reasonable.
- 1—Material Elevator, cement or agg. Enclosed. Complete with 7½HP motor, speed reducer, chain and buckets. 50' centers. Rated 50 TPH. Good condition. Price, \$1,500.00.
- 1—Material Elevator, cement or agg. Enclosed. With boot drive & speed reducer. No motor or chain. 58' centers. Good condition. Price, \$600.00.
- 1—Godfrey skip hoist. Winch Model FSJ. Complete less motor. Excellent condition. Price, \$200.00.
- 1—Godfrey skip hoist bucket. 1 ton cap. Complete with wheels, shafts, bearings, bail & block (New). Price, \$400.00.
- 1—320', ½" - 6 x 19 Hemp Center Wire Rope (New). Price, \$40.00.
- 1—Jeffrey Car Puller, rated cap. 5000 lb. Rope speed: 45 FPM. Good condition. Price, \$300.00.
- 2—12" x 18" Clam Type Blaw Knox Bin Gates. 1 New, 1 Rebuilt. Price, \$100.00 each.
- 1—Lot Automatic material handling and flow control equipment for concrete plant. Includes control panel, air rams, solenoid, Micro switches and Hi-Low indicators. Complete (New). Price, \$1,000.00.
- 1—Lot 18" elevator belt, 8 ply, various lengths, 15' - 60'. New and Used. Reasonable.
- 1—Used Gilson Laboratory analysis screen. Good condition. Price, \$150.00.
- 1—American marsh split cage centrifugal pump. 300 GPM. Complete with 20HP, 220-440V motor. Good condition. Price, \$250.00.
- 1—4" 2-Stage Turbine pump. Complete with Surface discharge head and motor. Condition good. \$150.00.
- 1—Link Belt Speed Reducer. Size D9-RH. Good condition. Price, \$300.00.
- 1—3HP Westinghouse motor - 220V, 1160 RPM. Frame 234C, Sleeve bearing. Rebuilt. Price, \$50.00.
- 1—7.5HP. Westinghouse Motor - 220-440V. 1165 RPM. Frame 324. Ball bearing, reconditioned. Price, \$75.00.
- 2—2" Neptune water meters, mod. 432, Code-o, complete with Dial-O-Matic selector, 2" Jenkins valve, Auto Step Register and Type "W" water strainer. Price, \$300.00.
- 1—2" Neptune Water Meters. Manual set dial, with 2" automatic cut off Jenkins valve - Series 200 - Type S. Complete rebuilt. Price, \$250.00.

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MISCELLANEOUS ITEMS—4" Jetting pump,
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New Hoist Brake Band Assembly with lining for Model 34 Lima \$ 8.00

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New M-6 38-ton High Speed Tractor \$2,500.00

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48"x10' Kolman triple-deck screen on 50"x42" Kolman Model 101

Get Multiple Separations With a Portable Plant

With either a double or triple-deck screen on a KOLMAN Model 101 Portable Conveyor-Screen Plant it is easy to make several sizes of material at one time. The plant has also proved ideal for scalping out oversize and rejected fines in a single operation. With the top deck removing oversize, the capacity of decks for screening fine material is increased. All this on a portable outfit.

Kolman Screens, designed to eliminate all weight, are ideal for conveyor installations. Their "floating action" avoids transmitting vibrations to the conveyor.

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COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
CONVEYOR - SCREEN - TRAP - FEEDER



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Left, two 5'x12' single-deck Kolman screens were mounted on 40"x42" 101 conveyors to produce over 2,000 t.p.h. of minus 1 1/2" base course gravel.

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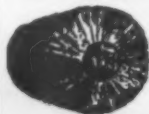
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LATE MODELS - EXCELLENT CONDITION
Manitowoc 2000B, 3000B, 3500, 3900 and 4500
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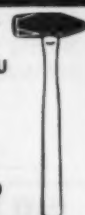
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Long Crawlers.
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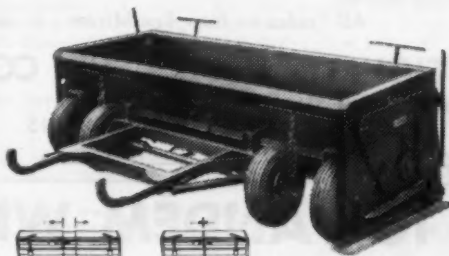
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If Sold Immediately.

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12'0" x 16", 8 gauge interlocking sheet
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 1 yd. MARION 43-M DRAG-CLAM. Good 1952 model, 60 ft. boom. Located Indiana. #9605
 1 yd. MARION 43-M DRAG-CLAM. Good 1951 model, 60 ft. boom. Located Indiana. #9426
 ¾ yd. MARION 32-M. Good 1956 model, no front end. Located Maryland. #21606
 4 yd. MARION 111-M DRAGLINE. Excellent 1958 model, 5 yd. Bucket, 80 ft. boom. Located Pennsylvania. #22010
 1½ yd. MARION 362 SHOVEL. Good 1953 model, 23 ft. boom. Located Indiana. #9892
 1 yd. MARION 43-M SHOVEL. Good 1956 model, Cat engine. Ohio. #21456
 1½ yd. MARION 362 DRAGLINE. Excellent 1959 model, 2 yd. Bucket, 60 ft. boom. Located Florida. #22107.
 ¾ yd. NORTHWEST 25 SHOVEL. Good 1948 model, gas power. Located New York. #11643

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Manufacturers' Literature

SPREADER-PAVER: The Warren All-Purpose heavy duty spreader paver is engineered for efficient application of hot and cold mixes, stone, slag and gravel and is described in literature from the Warren Mfg. Co., P. O. Box 413, Springfield, Ohio. Bulletin explains how telescopic action of spreader provides combination width dimension between 8 and 12 ft. Adjustable wheels are mounted inside runners on each side at front to prevent sinking when base is soft or loose.

For more details circle 168 on Enclosed Return Postal Card.

INDUCTION MOTORS: General Electric Co., Schenectady, N. Y., has issued a 14-page illustrated booklet that covers basic information necessary to electric motor users. The selection includes single and three-phase motors from ¾ to 150 hp. An application chart gives types recommended for various loads and ambient conditions. Tables are provided giving dimensions, prices, characteristics, performance data, modifications and accessories.

For more details circle 169 on Enclosed Return Postal Card.

ROTOR ACTION PUMP: A pump that uses a positive displacement pumping action to literally squeeze water upward, is the subject of a newly revised bulletin issued by Peerless Pump, Hydrodynamic, Division, Food Machinery and Chemical Corporation, 501 W. Avenue 26, Los Angeles, Calif. Trade named the "Hi-Lift", the pump employs a corkscrew-like rotor which rotates within a contoured stator; the action of the rotor creates a positive displacement action, moving a constant flow of water towards the surface. The unit will operate efficiently at one-half the normal pump speed (1,760 rpm), thus assuring longer pump life and greater operating economy, the maker states.

For more details circle 170 on Enclosed Return Postal Card.

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STEEL CATALOG: A new 86 page catalog, thumb indexed for instant reference to six different product classifications, has been issued by Apex Steel Corp., 6920 E. Slauson Ave., Los Angeles 22, Calif. According to the manufacturer, the catalog will be a short cut to basic data needed for ordering and planning. Included are engineering diagrams of each product, definitions of terms and conditions of sale.

For more details circle 178 on Enclosed Return Postal Card.

GEAR AND BEARING LUBRICANTS: An eight page brochure describing the characteristics and performance of Almasol Gear and Bearing Lubricants has been issued in a second edition. The literature, produced by Lubrication Engineers, Inc., 2809 Race St., Fort Worth, Tex., explains the chemical composition of the ingredients and how it acts to provide wear resistant qualities when added to regular lubrication compounds. A second part of the brochure is devoted to outlining a program for evaluation of the lubricants.

For more details circle 179 on Enclosed Return Postal Card.

TWO-WAY RADIO: A new bulletin showing two-way radio communication equipment available for businesses has been issued by General Electric Co., Lynchburg, Va. It describes frequency allocations and the various combinations of two-way radios possible in each frequency. Several sections cover amplifiers, portable hand-carried two-ways, desk-type base stations, floor-mounted units and pocket voice message receivers.

For more details circle 180 on Enclosed Return Postal Card.

DUMP BODIES: A new folder captioned "Bigger Legal Payloads" illustrates and describes a full range of Daybrook Aluminum Dump Bodies by Daybrook Hydraulic Div., Young Spring & Wire Corp., Bowling Green, Ohio. Featured are comments from operators who have used and worked with these units. The manufacturer suggests that the folder may be useful for contractors and haulers of aggregates who are seeking a more profitable trucking operation.

For more details circle 181 on Enclosed Return Postal Card.

BUCKET ELEVATORS: A new 12 page publication devoted to the new Link-Belt type 14 centrifugal discharge bucket elevators has been issued by Link-Belt Co., Prudential Plaza, Chicago 1, Illinois. The new book contains comprehensive engineering data that enables selection of a complete Type 14 elevator for any application. Included are selection tables that contain detailed information on such components as SS bushed chains, chain attachments, Style AC bucket sizes, and traction wheels and drives.

HEAT TRANSFER OIL: A technical bulletin on heat-transfer oil is now available from Sun Oil Company, 1608 Walnut Street, Philadelphia 3, Pa. The two-page bulletin gives complete information on Sun 21 heat-transfer oil, including properties and advantages. Some advantages claimed for the oil include: high thermal efficiency; high thermal stability; easy circulation; low pressure operation; absence of offensive odors; and long service life.

For more details circle 182 on Enclosed Return Postal Card.

CRAWLER MOUNTED LORAIN: A new 20 pg. catalog on the $\frac{3}{4}$ yd. crawler mounted Lorain Model 26 has been released by Thew Shovel Co., Lorain, Ohio. The booklet gives details of the machine's construction and job applications for use as a shovel, crane, clamshell, dragline, hoe and others. Photos of component parts and field pictures of the machine in action are also included.

For more details circle 183 on Enclosed Return Postal Card.

LOADERS: A new Power-Crowd Loader that scoops dirt while the tractor remains stationary is described in a bulletin just released by A. C. Anderson, Inc., Dept. 768, Wildwood, N. J. The bulletin illustrates how the heavy duty power crowd cylinders push the bucket into the pile for a full $\frac{3}{4}$ -yard load, and raise it aloft by heavy duty lift cylinders.

For more details circle 184 on Enclosed Return Postal Card.

MOTOR SCRAPER: A new 15-minute full-color movie, "Look to the TS-360," has been produced by Allis-Chalmers, Box 512, Milwaukee 1, Wisconsin. The 16 mm sound movie explains the production, operating and mechanical advantages of the new 30 cu. yd. TS-360 motor scraper without using the everyday "nuts and bolts" approach, according to the manufacturer. The TS-360 story has been woven around the theme of a contractor designing an all-hydraulic motor scraper to meet his actual field requirements.

For more details circle 185 on Enclosed Return Postal Card.

ELECTRON BEAM WELDING: A new twelve-page catalog has been released by Air Reduction Special Products Dept., 150 East 42nd St., New York 17, N. Y., on its newest welding technique, electron beam welding. Illustrated throughout, the brochure covers all of the features of electron beam welding, how the process operates and the equipment required. A full page schematic drawing of the electron beam gun is of particular interest.

For more details circle 186 on Enclosed Return Postal Card.

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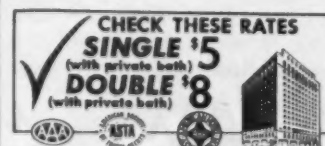
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With the Manufacturers

W. R. TIMKEN was elected president of the Timken Roller Bearing Co. at the annual meeting. Succeeding D. A. Bassmer, who has resigned because of ill health. Mr. Timken assumes the duties of the president immediately.

CHARLES S. E. DOBSON recently joined South Florida Asphalt Co. as operations manager. He was previously with Barber-Greene in that company's service division. During World War II Dobson spent many years building air bases in Alaska, Africa and South America. He has also conducted several operations for the Canadian government, where he spent the last five years supervising asphalt training school programs.

BRODERICK & BASCOM Rope Co. announced the appointment of J. J. Sieber, a vice-president, to the Board of Directors. Mr. Sieber joined the company in 1929, after graduation from Washington University.

ROBERT THORNBURG has been named manager of the engineering department

of Blaw-Knox Construction Equipment Div. He will be in charge of both design and production engineering. Thornburg will have offices in Mattoon, Ill., where the company's construction equipment production facilities are located.

THE RIPLEY Co., Middletown, Conn., reports that R. D. Evans has been appointed mid-western sales manager of the SunSwitch Div. Previously, Evans was associated with G. E. where he served as product service engineer.

EASTMAN KODAK came under a new president, W. S. Vaughn, during May. Vaughn has served the company as vice-president and general manager as well as director, prior to his promotion. He succeeds A. Chapman who has served as president since 1952.

HARRY B. BRACEY, JR. has been named administrative assistant to the general manager of the Construction Equipment Div. of American-Marietta Co. Bracey, in his new office, will coordinate new marketing facilities, products lines and product research.

A MEETING HELD IN MAY by the Barber-Greene Co. and Smith Engineering Works resulted in the merger of the two companies. Based on an exchange of common stock, six shares of Barber-Greene for one share of Smith, the merged company will operate under its present management as a division of Barber-Greene.

WILLIAM K. MCGRATH has been appointed Chicago district engineer of American Bridge Div. of U. S. Steel Corp. McGrath, who will succeed A. P. Boysen, recently retired, is a graduate of Mississippi State College and has done engineering work abroad.

FIRST RETURNS on exhibit space for the 6th annual convention on the Prestressed Concrete Institute, to be held in September, are running in excess of expectations, according to that organization. The current report, it was announced, shows twenty manufacturers and service organizations concerned with the industry.

KEUFFEL & ESSER Co. lately an-

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welcome
to the world



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Miramar and NEW TOWER

California's World Famous Resort overlooking the Blue Pacific where Wilshire meets the sea. Twenty minutes from International Airport. 450 luxurious rooms and bungalows, all with television and radio. Complete convention facilities. Banquet rooms for up to 2,000, air-conditioned. Exciting new Venetian Room and Cantones Room. Swimming pool . . . Beautiful grounds and landscaped gardens. Rates from \$8. Write William W. Donnelly, Gen. Mgr.

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Manager

KING'S GATEWAY Hotel and Inn



Land O' Lakes, Wisconsin

nounced the appointments of two new vice-presidents, J. R. Juten, and Eugene Koenig. Juten is in charge of industrial relations, Koenig is in charge of the Metrology Div.

A NEW PROGRAM which will allow customers to design, order and receive quick delivery of street lighting systems has been announced by General Electric. Called "Preferred Lighting," the program offers simplified selection of many components, and allows the customer to plan using a pre-calculated application for information and layouts.

CATERPILLAR TRACTOR Co. has been named to receive one of the *Saturday Review's* eighth annual awards for Distinguished Advertising in the public interest. Twenty-four other companies were included; Caterpillar was the only heavy equipment company honored.

THE APPOINTMENT of D. L. Crandell as Chicago Sales Mgr. for Keuffel & Esser Co. was announced recently. Crandell will be in charge of sales originating in the company's Chicago office.

CONSTRUCTION OF A MULTIMILLION

dollar tire manufacturing plant has started in Bethune, France, Firestone Tire & Rubber Co. announced recently. Reportedly, the decision was made because of the excellent transportation facilities and the availability of efficient man power and materials in that area.

EDWIN F. SHELLEY of USI Robodyne has been appointed to group officer and vice-president of U. S. Industries, Inc., the parent company, it was announced. The new post will give Shelley executive supervision over the USI Technical Center in Florida.

BENDIX AVIATION CORP. has announced that the word "Aviation" has been dropped from the company's title and henceforth will operate under the official name of The Bendix Corporation.

THOMAS W. FLOOD, formerly with Electric Autolite Co., has joined Willys Motors where he has been appointed special assistant to that company's president. The new position will require Mr. Flood to deal in domestic and export trade.

A MULTI-MILLION DOLLAR corrugated container plant was recently an-

nounced by the Flintkote Co. Subject to approval of a bond issue by voters of Pike County to finance construction of the plant, Flintkote will lease the projected streamlined facility on a long-term basis from the State of Mississippi. The proposed project will be built in Magnolia, Miss.

PLANS FOR RELOCATING the main office of Rex-Spanall, Inc., from New York City to Milwaukee were announced today by J. Sproule of that company. A subsidiary of Chain-Belt, the firm already has one office in Milwaukee. Rex-Spanall recently purchased Spanall of the Pacific, Inc. in California.

THE FIRST BRITISH-MADE, heavy diesel trucks to be shown and offered for sale in the U. S. were seen at the British Exhibition in New York during June. The Leyland truck exhibition included two haulage models of trucks, consisting in cabs and chassis, an operating show model of a Leyland diesel motor and a mounted display illustrating functional aspects of the new trucks.

BORG-WARNER ANNOUNCED that effective June 1, Mr. J. B. Elliott will assume the duties of president and general manager of the New York Div. of that company.

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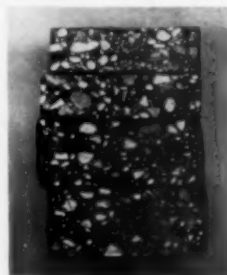
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Cross-section assembled in the laboratory from specimens cut from the road of 7½-inches of hot-mix with Texaco Asphalt. The four layers from the top down are the 1½-inch surface, 1½-inch binder course and 4½-inch base (laid in two courses).

The load-carrying capacity of Minnesota Trunk Highway No. 7 was doubled by resurfacing it with 7½ inches of hot-mix with Texaco Asphalt.

ASPHALT doubles a highway's strength

The original pavement on this Minnesota trunk highway was laid in 1952. It was designed to carry 1,000 vehicles a day and a maximum axle load in spring of five tons. The pavement consisted of a 9-inch gravel base and subbase, topped by a 1½-inch surface of asphalt hot-mix.

Last year, this highway's load-carrying capacity was increased to 2,000 vehicles a day and its maximum allowable axle load in spring increased to nine tons. This was accomplished at moderate cost in a minimum of time by resurfacing the 1952 pavement with 7½ inches of hot-mix, using Texaco Asphalt. The new pavement was composed of a 4½-inch asphalt base course, a 1½-inch binder course and a 1½-inch wearing surface.

This Minnesota project is an excellent example of how perfectly Asphalt lends itself to stage construction of a highway, adding strength when called for by increased traffic, while distributing cost over the years.

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